422. d.



S. Devoto Inv.t *Toms Sc.*

Begin with Sense, of ev'ry Art the Soul
Part ans'ring Part, shall slide into a Whole.

Pope.

Dictionarium Polygraphicum:

Or, The Whole

BODY of ARTS

Regularly Digeſted.

CONTAINING,

I. The ARTS of Deſigning, Drawing, Painting, Waſhing Prints, Limning, Japanning, Gilding: Alſo Perſpective, the Laws of Shadows, Dialling, &c.

II. Carving, Cutting in Wood, Stone; Moulding and Caſting Figures in Plaiſter, Wax, Metal; Engraving, Etching, and Mezzotinto.

III. An hiſtorical Account of the moſt conſiderable Painters, Sculptors, Statuaries, and Engravers; with thoſe Cyphers or Marks by which their Works are diſtinguiſhed.

IV. An Explanation of the Emblematical and Hieroglyphical Repreſentations of the Heathen Deities, Powers, Human Paſſions, Virtues, Vices, &c. of great Uſe in Hiſtory-Painting.

V. The Production, Nature, Refining, Compounding, Tranſmutation and Tinging all Sorts of Metals and Minerals of various Colours.

VI. The ARTS of Making, Painting or Staining all Sorts of Glaſs and Marble; Enamelling; Methods of imitating Precious Stones, Pearls, &c.

VII. Dying all Sorts of Materials, Linen, Woollen, Silk, Leather, Wood, Ivory, Horns, Bones; alſo Bleaching and Whitening Linen, Hair, &c.

VIII. The ART of Tapeſtry-Weaving, as now performed in England, Flanders, and France, either of the high or low Warp; and many other curious Manufactures.

IX. A Deſcription of Colours, Natural and Artificial; their Productions, Natures or Qualities, various Preparations, Compoſitions, and Uſes.

X. The whole ART of Pyrotechny, or Fire-Works; and the Chineſe Method of making Porcelain: Together with a great Variety of other curious Particulars not here enumerated.

Illuſtrated with Fifty-ſix COPPER-PLATES.

The SECOND EDITION, Corrected and Improved.

In TWO VOLUMES.

LONDON:

Printed for C. HITCH and L. HAWES, in Pater-noſter-Row; J. HINTON, in Newgate-Street; and L. DAVIS and C. REYMERS, againſt Gray's-Inn, Holborn. M.DCC.LVIII.

W. Musgrave.

MVSEVM
BRITAN
NICVM

To the Right Honourable

GEORGE

Earl of Macclesfield,

PRESIDENT

OF THE

ROYAL SOCIETY,

THIS

Improved EDITION of the

POLYGRAPHIC DICTIONARY

Is Inscribed,

By his Lordship's

Most obedient, and

Most humble Servant,

J. Barrow.

To the Right Honorable

GEORGE

Earl of MACCLESFIELD,

PRESIDENT

of the

ROYAL SOCIETY,

&c. &c. &c.

Inscribed by Permission of the

POLYGRAPHIC DICTIONARY

&c. &c. &c.

By his Lordship's

Most obedient and

Most humble Servant,

J. Barrow.

THE

PREFACE.

SUCH *is the intrinſic Excellency, as well as Amiableneſs, of the ſeveral* Arts, *to which theſe Volumes are an* Introduction; *ſo many are the real and ſubſtantial Advantages flowing from a familiar Acquaintance with them; and ſo rich a Fund do they afford of the moſt rational and refined Amuſement; as to encourage us to hope, that an Attempt to render them more diffuſively conducive to anſwer theſe valuable Purpoſes will meet with ſuch a candid Reception from the Public, as the Intention, at leaſt, ſeems to deſerve.*

PERSPICUITY *of Expreſſion being eſſentially neceſſary to a Work of this Nature, we have endeavoured to place every Subject in a Light ſo clear and intelligible, that the ſtudious and attentive Reader, we flatter ourſelves, will eaſily make an Improvement*

anſwer-

anſwerable to his moſt elevated Expectations.

In *order more fully to illuſtrate the reſpective* Arts, *we have diligently explained their very* Elements, *from whence, as a Foundation, each of them has been traced to its preſent Perfection; gradually advancing from one Rule, or Step, to another, that an adequate Idea might be conveyed of every material Circumſtance; and being conſtantly ſollicitous to avoid obſcure Conciſeneſs on the one Hand, or ſatiating Prolixity on the other.*

We *have likewiſe given a* ſuccinct Account *of the* Materials *employed in each of the* Arts *under Conſideration, with ample Directions for their particular Application; nor are they only repreſented in their natural State, but attended through every Operation preparatory to the Forms in which they are exhibited in the Shops; and Methods are alſo laid down, to diſtinguiſh the pure and genuine from ſuch as are adulterated or factitious.*

And, *as it was our Deſign to intermix* Pleaſure *with* profitable Inſtructions, *in order to gratify the* Fancy, *as well as improve*

prove the Judgment, *we have interſperſed a plentiful Variety of curious and entertaining Hiſtorical Anecdotes of the moſt celebrated Maſters of* Painting *and* Deſigning; *diſtinctly deſcribed their peculiar Characters and Turns of Genius; pointed out the Courſe of their Studies; and ſhewn to what an amazing Height they carried the Arts they profeſſed.*

A WORK *of this Kind muſt neceſſarily be collected from various Authors; but, in this Reſpect, we have been aſſiduous to ſelect our Materials from the beſt and moſt approved, and to digeſt them into ſo natural and regular a Series, as to inable the diligent Peruſer to make a ſurpriſing Progreſs, both with regard to* Theory *and* Practice, *in theſe engaging Studies; to all which we may be allowed to add, that our preſent Undertaking, wherein we have taken Care to omit nothing that could tend to elucidate every Article, will ſuperſede the Neceſſity of purchaſing, at a great Expence, or the fatiguing Employment of conſulting a Multiplicity of voluminous Productions.*

THE *former Edition of the* POLYGRAPHIC DICTIONARY *was in ſome Places redundant,*

dant, and in others defective; it erroneously misrepresented some Particulars, whilst the Descriptions of others were far from being so accurate as the Nature of the Subject required: But in this it has been the Editor's Care to rectify all these Mistakes, and to render the Whole as complete as possible, from the latest Discoveries and Observations.

THE

THE
POLYGRAPHIC DICTIONARY.

A.

A. B. Theſe two letters joined together, with an E iſſuing out from the B, is the mark of Alexander Badiale of Bologna, painter and engraver.

AB. BL. *in*, ſtand for Abraham Bloemart, an indefatigable Duch engraver.

A. BOTH, ſtands for Andrew Both.

A. C. P.
A. C.
AGOS. C.
AG. C.
AG. Bononiæ,

} Are all the marks of Auguſtino Caracci of Bologna, a celebrated painter and engraver.

ACADEMY *of Painting* was eſtabliſhed in France, during the reign of king Lewis XIV, under cardinal Mazarine, its firſt protector; and the chancellor Seiguer, vice-protector.

It conſiſts of a director, a chancellor, four rectors, a treaſurer, twelve profeſſors; counſellors, a ſecretary; a profeſſor of anatomy, another of geometry and perſpective.

Perſons are admitted in this Academy, either in quality of painters or ſculptors. The painters are admitted according to their reſpective talents; there being a diſtinction made between thoſe who work in hiſtory, and thoſe who only paint portraits or landſcapes, or beaſts, or fruits, or flowers, or paint in miniature, or only deſign; or engrave or carve.

ACHELOUS, the river, is deſcribed by Ovid, adorned with a garland of reeds, willows, and the like: Having two urns or earthen pitchers, the one empty, and the other pouring forth water; and having on his head two horns, the one broken, and the other whole.

This river, as it is the moſt famous of all Greece, ſo it divides Ætolia from Arcadia, and then falls into the ſea.

This repreſentation is taken from the fable of Hercules, how combated him in the likeneſs of a bull, for the ſake of his wife Dejanira, and broke one of his horns; there byturning both its ſtreams into one, for which reaſon one of the urns is repreſented empty.

ACTION, in painting and ſculpture, is the poſture of a figure; or the action it is ſuppoſed to be in; expreſſed by the diſpoſition of its parts, or the paſſion appearing in its face. See ATTITUDE and EXPRESSION.

A. D. J. F, ſignifies Anthony Jacquart fecit. He engraved ſeveral pieces.

ADAMO, a ſculptor of Mantua, engraved the angels of Michael Angelo Buanoroti, in ſeventy-three plates, and worked for other maſters, and marked his plates with the mark, on plate I, N°. 1.

ADMIRATION, the firſt and moſt temperate of all the paſſions, wherein the heart feels the leaſt diſturbance; and therefore the face receives little alteration thereby; and, if any, it will only be the raiſing of the eye-brows; the ends thereof being yet parallel; the eye will be a little more open than ordinary, the ball and even the lids without motion being fixed on the object, which cauſes the Admiration.

The mouth will be open; but will appear without alteration, any more than the other part of the face.

This paſſion produces only a ſuſpenſion of motion, to give time to deliberate what ſhe has to do, and to conſider attentively the object before her; if that be rare and extraordinary, out of this firſt and ſimple motion of Admiration is engendered eſteem. How this paſſion is repreſented in drawing, ſee plate II.

ÆGIPAN, [of Αἰξ αἰγὸς, Gr. a goat] a denomination given to the heathen god Pan, and the Panes, on account of their being repreſented in painting with the horns, legs, feet, &c. of that animal.

Salmaſius, in his notes on Solinus, takes Ægipan to have ſignified the ſame in Lybia with the Sylvans among the Romans.

Voſſius oppoſes this opinion, and ſhews that the Ægipanes had not faces like men, as the Sylvans had; but like gods. In effect the whole upper part of the body reſembled that animal; and, as to the lower, they painted it with a fiſh's tail.

A. Æ. ADAM ÆLZHEIMER, who wrought with Peter Bruguel, marked his pieces with the mark, on plate I, N°. 2.

ÆNEAS, the Trojan prince, is painted in a purple mantle trimmed with gold.

ÆOLUS, the god of the winds, is depicted with ſwoln, blubbed cheeks, like one who forcibly ſtrives to blow a blaſt; two ſmall wings upon his ſhoulders, and a fiery, high countenance.

ÆS USTUM, to make. Take bits or thin leaves of copper, fifteen ounces; ſulphur in powder, ten ounces; ſea ſalt finely powdered, fifteen ounces; fill the crucible by laying in

layer upon layer; put it into a furnace of live coals, and let it ſtand till the ſulphur is wholly conſumed; then take it out, and it will be of an iron grey, but reddiſh within; it gives a noble fine tincture to glaſs.

Another Æs Ustum. Take thin plates of the reddeſt copper (i. e. the roſe copper) make it red-hot, and extinguiſh it in urine, in which common ſalt has been diſſolved: Reiterate this operation till it becomes of the colour of gold, both within and without; after which cement thoſe places with this powder. Or

Take ſulphur, two pounds; ſalt-petre, two pounds; vitriol calcined to redneſs, one pound; reduce all to a powder; put the plates with the powder into a crucible layer upon layer; cover it with another crucible having a hole in the bottom; lute them together, and, being dry, put them into a circulatory fire (having hot embers underneath) for ſix hours: For the firſt two hours let the fire be a foot diſtant from the crucible, the ſecond two hours let it be half a foot from the crucible, and the laſt two hours let it be cloſe to the crucible, and cover it.

Take care that the fire be not too violent, that the matter may not melt, for, if it does, it is ſpoiled. When it is cold, reduce it to a fine powder, waſh it, dry it, and keep it for uſe.

There are other curious perſons who make an Æs Uſtum yet finer than this, and more penetrating in colours; but the preparation is more coſtly, and acquires more time; for, inſtead of brimſtone and ſalt-petre, they make uſe of a purified ſulphur, and fixed with ſal-armoniac; and inſtead of ordinary red vitriol they uſe Roman vitriol, which they prepare with the lee of urine, and a fuſil ſalt; which they afterwards put into a reverberatory.

But ſince the before mentioned will ſerve well enough for colouring glaſs, and are eaſier to make, I ſhall omit giving the preparation of this.

A. F. is a mark found in ſome plates of Albert Durer.

AFFECTION, in painting, is deſcribed like a comely ancient lady, winged, holding in her hands a woodcock, and having a lizard at her feet.

Her age ſhews ſhe is conſtant; winged, becauſe Affection is produced in an inſtant; the cock and lizard are emblems of good-will by inſtinct; her poſture ſhews, that benevolence between two, for a long time, becomes at laſt one true friendſhip.

AFRICA, is repreſented by a black woman, almoſt naked; having frizzled hair, an elephant's head for a creſt, a necklace of coral, and pendants of the ſame; at her ear a ſcorpion; holding in her right hand a cornucopia, with ears of corn in her left hand; a fierce lion by her on one ſide, and a viper and

ſerpent on the other; ſhe is naked, becauſe it does not abound with materials for cloathing; the elephant is an animal with which Africa abounds; as it alſo does in vipers and ſerpents.

A. G. ſtands for Albert Glochentonius, in the twelve plates repreſenting our Saviour's paſſion.

AGATE, a precious ſtone, partly tranſparent, and partly opake. There are various kinds of Agates; which according to their colours, degrees of tranſparency, &c. have different names; as the onyx, the chalcedony, the black and the German Agates. The Agate has commonly a reddiſh teint; but is finely variegated with ſpots and ſtains, many of which ſeem very naturally to repreſent woods, rivers, trees, flowers, fruits, animals, &c.

The ſardines and ſardonyx Agates are very valuable; the latter is of a ſanguine colour, and is divided into zones, which ſeem as if they had been painted by art.

Agate has always been eſteemed for ſeals, as being a ſtone that no wax will ſtick to.

Gold wire-drawers burniſh their gold with an Agate, whence the inſtrument uſed for that purpoſe is called an Agate.

AGE, in general, is repreſented, in painting, by a lady in a garment of three colours, holding up her hands, with a ſun in her right hand, and a moon in her left; the right being higher than the left; and below a baſiliſk erected.

The changeable habit denotes the changing of the minds and purpoſes of ſeveral Ages; the ſun and moon intimate their regulating the three principal members, the head, heart, and liver, where the vital, animal, and natural virtues reſide.

Robert AGGAS, a good Engliſh landſcape-painter, both in oil and diſtemper; in which kind he painted many ſcenes for the play-houſe in Covent-garden; there are not many of his pictures extant amongſt us; of thoſe that are the moſt conſiderable, is a piece of landſcape, preſented by him to the company of painter-ſtainers, (whereof he was a member) and which now hangs in their hall; he was reckoned amongſt the beſt of our Engliſh landſcape-painters; and died in London 1679, and about ſixty years of age.

AGOSTINO, a Venetian, ſcholar to Mark Antonio Raimondi, in Rome, engraved the paintings of Raphael Julio Romano, and others; uſed the mark repreſented on plate I, N°. 2. He alſo marked with the letters AVI, or AV, 1525.

AGRICULTURE, is repreſented in painting with a homely face, but comely notwithſtanding; cloathed in a green gown, crowned with a garland of ears of corn, holding a zodiac in her left hand, a ſhrub in her right, and a plough-ſhare at her feet.

Her verdant robe betokens hope, without which no-body would labour. The twelve ſigns of the zodiac intimate the different ſeaſons which the tiller ought to obſerve; the plough is the moſt neceſſary inſtrument in Agriculture.

A. L P. I. ſtands for Anthony Licinio Porduore inv. Edward Tualetti, ſc.

ALABASTER, a kind of ſtone, ſofter than marble, yet harder than plaiſter of Paris.

It is found of all colours; ſome extremely white and ſhining, which is the moſt common; ſome red like coral; and other called onyx, from its colour; which reſembles that of the onyx, though very different from it in nature.

Alabaſter cuts very ſmooth and eaſy, and is much uſed by ſculptors for little vaſes, columns, &c.

It is alſo ſometimes employed like plaiſter of Paris: In order to which they burn and calcine it; after which, mixing it up with water to a thin conſiſtence, it is caſt in a mould, where it readily coagulates into a firm body.

How to clean ALABASTER. Beat pumice-ſtones to an impalpable powder, and mix it up with verjuice; let it ſtand thus for two hours: Then dip in it a ſponge, and rub the marble or Alabaſter therewith; waſh it with a linen cloth and freſh water, and dry it with clean linen rags.

Franciſco ALBANI, a Bologneſe, born in the year 1578, a diſciple of the Carraches, one of the moſt agreeable pencils in the world, in all parts of painting; but principally admired for his performances in little, and had a peculiar genius for naked figures; and, the better to accompliſh himſelf for that purpoſe, married a beautiful woman, and uſed himſelf to the deſigning of naked Venus's, the graces, nymphs, &c. and little children, Cupids dancing and playing in all the variety of poſtures imaginable. He died anno 1660, aged eighty-two years.

Cherubino ALBERTO *Borghegiana*, i. e. *de Borgo, S. Sepulchro*, uſed the two marks you will ſee on plate I, N°. 3, 5. He engraved the works of Michael Angelo and others.

ALBERT ALDOGRAFT, of Weſtphalia, a famous engraver, marked his pieces with the mark on plate I, N°. 6.

ALGA, is a plant that grows by the ſea-ſide, and thence is called ſea-weed, or ſea-moſs; it is found on moſt coaſts, thrown up by the ſea.

This herb, when gathered, if it be kept freſh and moiſt ſome time, will ſhew afterwards its white ſalt on the ſurface of its leaves. The inhabitants of thoſe parts nigh the ſea commonly gather it together on the ſhore, and dry it by often turning it in the ſun, as hay is made; after it is dry they burn it, and its aſhes yield an alkali ſalt, fit for making glaſs and alum.

The Engliſh make uſe of it for both, and call the aſhes kelp.

ALEXANDER ALGARDI, a ſculptor of Bologna, marked with the mark N°. 11, in a concluſion engraven by Francis du Poylli, in 1653; but at other times made uſe of the ſame mark, but without the G.

ANTONIO ALLEGRI DA CORREGGIO, born in the year 1494, diſciple of Frari di Modena, lived in Lombardy, excelled in hiſtory-painting, died in the year 1534, aged forty years.

ALUM, a peculiar kind of ſalt, ſeparated by art from various ſubſtances. In Italy it is obtained from a ſoft reddiſh ſtone; about Puteoli, from ſeveral kinds of earth, and, in England, from a whitiſh or bluiſh ſtone, called Iriſh ſlate.

In ſome parts of the world, Alum is found pure; having been waſhed from its ore by water, and afterwards, on the evaporation of the water, left in a dry form.

Proceſs of making ALUM *at Whitby in Yorkſhire.* Alum is made thus: Having burnt a quantity of the ore with whins or wood, till it becomes white; they then barrow it in a pit, where it is ſteeped in water, for eight or ten hours. This liquor, or lixivium, is conveyed by troughs to the Alum-houſe, into ciſterns; and from them into the pans, where it is boiled about twenty-four hours. Then add a certain quantity of the lee of kelp; the whole is drawn off into a ſettler, where having remained about an hour, that the ſulphur and other dregs may have time to ſettle to the bottom, it is conveyed into coolers: This done, to every ton of the liquor they add about eight gallons of urine; and having ſtood four days and nights, till quite cool, the Alum begins to cryſtalliſe on the ſides of the veſſel, from which being ſcraped off, it is waſhed with fair water, and then thrown into a bin, to let the water drain off; after this it is thrown into a pan, called the rocking pan, and there melted, in which ſtate it is conveyed by troughs into tuns, where it ſtands about ten days, till perfectly condenſed; then, ſtaving the tuns, the Alum is taken out chipped, and carried to the ſtorehouſes. This is what we commonly call roche, or rock Alum, as being prepared from ſtones cut from the rocks of the quarry, and ſtands contradiſtinguiſhed from the common Alum, or that prepared from the earth.

ALUM *Water*; boil four ounces of Allum in a quart of rain or river water, till the Allum is diſſolved, and let it ſtand twenty-four hours.

With this water waſh the prints you deſign to colour, and it will fix the paper ſo, that the colours will not ſink or run in it, when you lay them on, and will help, likewiſe, to brighten your colours.

If your paper is very thin and looſe, then waſh it with this Allum-water four or five times, letting it dry between every time; and your paper muſt always dry before you lay on any of your colours.

But take notice, that, if you deſign to varniſh your prints after they are coloured, then waſh the prints all over equally with white ſtarch before you colour them, and, when that is dry, lay on the colours.

The method of ALUMING *of ſtuffs, particularly for dying reds.* Hang rain or running water over the fire, adding one third part of the ſtarch or bran-water; put in for every pound of ſtuff two ounces of alum and an ounce of tartar, and, when it boils and froths, firſt ſkim it, and then put in the ſtuff, ſtir it very well about for an hour, then take it out and rinſe it.

The quantity of alum muſt always be double to that of the tartar; ſome dyers reject red-wine tartar, and uſe only white; others eſteem the red better, eſpecially for crimſons, and all browniſh-red dyes; and indeed it is very good in all good ſtuffs, that require a little red preparatory ground, before they are dyed black.

AMALGAMA, is a maſs of mercury united and incorporated with ſome metal.

The Amalgama of mercury with lead, is a ſoft friable ſubſtance of a ſilver colour. See LEAD.

By waſhing and grinding this Amalgama with fair warm water in a glaſs mortar, the impurities of the metal will mix with the water, and, by changing the water and repeating the waſhing again and again, the metal will be further and further purified.

Dr. Boerhaave ſpeaks of amalgamation, as one of the greateſt ſecrets in chymiſtry, to contrive to bring off the water at laſt as clear and unſullied as when firſt poured on the Amalgama, which might afford a method of making the nobler metals, or procuring them from the baſer.

This philoſophical way of purifying metals may be applied to all metals, except iron and copper.

AMALGAMATION, is performed by fuſing, or, at leaſt, igniting the metal; and, in this ſtate, adding a proportion of mercury to it; upon which they mutually attract and incorporate with each other.

Gold unites and amalgamates with mercury with the greateſt facility, next to that of ſilver, then lead and tin, and all metals except iron and copper.

The Amalgamation of gold is performed by heating the laminæ, or plates of metal, red-hot, and afterwards pouring quickſilver on them, and then ſtirring the mixture with a little

iron rod till it begins to riſe in ſmoke; this is afterwards poured out into a veſſel full of water, where it coagulates and becomes manageable.

This Amalgamation or calcination is of great uſe, not only to goldſmiths, but alſo to gilders, who, by this operation, render gold fluid and ductile for their uſes. Such amalgama, or mixture, being laid on any other metal, as ſuppoſe copper, and this afterwards placed on the fire to evaporate, the gold will be left alone on the ſurface of the copper or other metal, and is what we call gilding.

The blackneſs that adheres to the amalgama may be waſhed away with water, and much of the mercury may be ſqueeſed or preſſed out through a linen cloth; the reſt being evaporated in a crucible, the gold will remain behind in an impalpable powder.

Gold will retain about three times its own weight of mercury.

This operation is denoted among chymiſts by the letters A A A.

AMBER, is a yellow tranſparent ſubſtance, of a gummous and bituminous form and ſubſiſtence, but a reſinous taſte, and a ſmell like oil of turpentine.

It is chiefly found in the Baltic ſea, along the coaſts of Pruſſia, &c.

Naturaliſts differ widely in their opinions as to the origin of Amber, and as to what claſs of bodies it belongs to; ſome ſuppoſing it to proceed from vegetables, others from a mineral, and even ſome from animals.

Pliny deſcribes it as a reſinous juice oozing from aged pines and firs, others from poplar-trees (of which there are whole foreſts on the coaſts of Sweden) and diſcharged thence into the ſea; where, having undergone ſome alteration, it is thrown in this form upon the ſhores of Pruſſia, which lie very low.

Some have imagined it a concretion of the tears of birds; others the urine of beaſts, others the ſcum of the lake Cephiſide, near the Atlantic; others a congelation formed in the Baltic ſea, and in ſome fountains, where it is found ſwimming like pitch.

Others ſuppoſe it a bitumen, trickling into the ſea from ſubterraneous ſources; there concreted into this form, and thrown aſhore by the waves.

This laſt opinion was for a long time moſt popular, and ſeemed to have the beſt foundation: But this too is now diſcarded, as good Amber having been found in digging the ground, at a conſiderable diſtance from the ſea, as that gathered on the coaſts.

Others

Others take Amber to be a compound ſubſtance, and ſay that Pruſſia, and other countries, that produce Amber, are moiſtened with a bituminous juice, which mixing with the vitriolic ſalts abounding in thoſe places, the points of thoſe ſalts fix its fluidity, whence it congeals; and the reſult of that congelation makes what we call Amber.

The moſt remarkable property of Amber is that, when rubbed, it draws or attracts other bodies to it, and alſo, that by friction it is brought to yield light pretty copiouſly. As for the mechanical uſes of Amber, it is uſed in making varniſhes for ſeveral uſes.

To make artificial AMBER. Boil turpentine in an earthen pot, with a little cotton (ſome add a little oil) ſtirring it, till it is as thick as paſte, then put it into what you pleaſe, and ſet it in the ſun for eight days, and it will be clear and hard: Of which you may make beads, hafts of knives, or the like.

To make yellow AMBER *ſoft.* Put yellow Amber into hot melted wax well ſcummed, and it will be ſoft, ſo that you may make things of it of what form or faſhion you pleaſe.

Melt ſome turpentine in a glaſs, in a ſand heat, where the fire may be raiſed at diſcretion; then provide your ſelf with three ounces of Amber, either of the whiteſt or yelloweſt ſort.

To melt AMBER, *and caſt it into any figure, with flies or any ſmall animals in it, as is ſeen in thoſe valuable pieces of Amber ſold at a great price. From Mr. Boyle.*

Levigate your Amber, and ſprinkle in the powdered Amber into the melted turpentine, ſtirring it all the while with a piece of fir-wood, till you find no reſiſtance; then, if you find your melting to reſiſt the ſtick, drop in, by degrees, a little Venice turpentine, and keep it ſtill ſtirring, till all the powdered Amber is diſſolved, and is thick enough to pour into moulds; and, when it is cold, you will have what figure you propoſe remain as hard as Amber itſelf, with all the ſame qualities that Amber commonly has.

An AMBER *Varniſh, from Mr. Boyle.* Take of white roſin four drachms, melt it in a clean glazed pipkin, then put into it two ounces of the whiteſt Amber you can get, finely powdered, by little and little, ſtirring it with a ſmall ſtick over a gentle fire, till it diſſolves, pouring in, now and then, a little oil of turpentine; when you find it begin to grow ſtiff, ſo continue to do till all the Amber is melted.

But great care muſt be taken that you do not ſet the houſe on fire, for the very vapours of the oil of turpentine will take fire by heat only; but, if it ſhould happen to do ſo, immediately cover the veſſel cloſe with a flat board or wet blanket, and, the air being kept from it, it will go out.

It will be beſt to melt the roſin in a cylindrical glaſs, in a bed of hot ſand, after the glaſs has been well annealed, or warmed by degrees, in the ſand; under which you muſt keep a gentle fire.

When the varniſh is made, pour it into a coarſe linen bag, and preſs it between two hot boards of oak or iron, and uſe it with any of your colours, as well as to varniſh them over when they are painted.

AMBER-GREASE, is a fragrant drug, which melts pretty much like wax; commonly of a grey or aſh colour; uſed as a perfume, &c.

Naturaliſts are of various opinions, as to its origin and production.

Some ſuppoſe it to be the excrement of a bird, which, being melted by the heat of the ſun, and waſhed off the ſhore by the waves, is ſwallowed by whales, who return it back in the condition in which it is found. Some take it for a kind of wax or gum, which diſtils from trees, and drops into the ſea, where it congeals, and becomes Amber-greaſe. Some affirm it to be a vegetable production iſſuing out from the root of a tree, whoſe roots always ſhoot towards the ſea, and diſcharge them into it. Some ſuppoſe it to be a kind of a ſea muſhroom, which is torn up from the bottom by the violence of tempeſts; it being obſerved, that Amber-greaſe is ſeldom found, but after ſtorms. Some are of opinion, that Amber-greaſe is formed from the honey-combs, which fall into the ſea from the rocks where the bees have hived, or made their neſts; which laſt opinion was lately generally allowed, as having ſomething of experience in its favour; ſeveral pieces of it having been ſeen that were half Amber-greaſe, and half plain honey-comb; and large pieces have been found, which, when broken, honey-comb and honey too, have been found in the middle. And others take it to be a bituminous matter, which is at firſt liquid and runs into the ſea, and is there condenſed and reduced to a maſs; of this opinion are the beſt naturaliſts.

Amber-greaſe is of conſiderable uſe in making perfumes, by melting it over a gentle fire, and making extracts, eſſences, and tinctures of it.

Amber-greaſe is often adulterated as follows: They take ben nuts an ounce and an half, and pound them to a perfect pulp; and add an ounce and an half of ſperma ceti; beating them well together; then they add benjamin in fine powder, orrice of Florence finely powdered, and white ſtarch, of each three ounces and an half; bitumen, reduced to fine powder, half an ounce; muſk, reduced to fine powder, a quarter of an ounce; Amber-greaſe, in fine powder, three ounces: Theſe are mixed toge-

together, with a mucilage of gum tragacanth made into a maſs or paſte, and well wrought together with the hand.

AMBITION, is repreſented, in painting, by a virgin cloathed all in green, with ivy branches, ſeeming as about to leap over a craggy rock, on the top of which are ſcepters and crowns; ſhe is attended by a lion lifting up his head. The ivy denotes Ambition, always climbing higher, and ſpoiling the walls; the ambitious ſparing neither the country, religion, nor counſellors, that ſo he may but only become greater than others; the lion is an emblem of pride.

AMERICA, is repreſented by a woman, almoſt naked, with a tanned or tawny aſpect, having a veil folded over her ſhoulders; round her body an artificial ornament of feathers of divers colours; holding in her hand a bow, and having a quiver on her ſhoulder or by her ſide, and at her feet a human head pierced with an arrow, and on the ground a lizard.

Naked, becauſe the inhabitants are all ſo; the arms are what both men and women uſe; the human head intimates that they are cannibals; the lizards are reported to be ſo large there, as to devour men.

AMETHYST, the name of a very well known and beautiful gem. The ſtone, called Amethyſt by the ancients, was evidently that which is now called by this name, which is far from being the caſe in regard to ſome of the other gems. And the gem they alſo called the hyacinth, was alſo no other than a variety of this ſtone, reſembling a flower of that name.

They accounted, beſides that, alſo five other ſpecies of the Amethyſt, all which were truly no more than varieties of this ſtone in the degree of colour; and all which we alſo have at preſent, though not known among our jewellers under any particular names. Indeed there might be numberleſs names, and numberleſs ſpecies accounted of this gem, if they were to be given according to its different degrees of colour; it having ſometimes a bluer, ſometimes a redder purple, and varying in degree, through all the changes between the colour of the ripe purple grape and the colourleſs hue of the pureſt cryſtals.

It is inferior to ſcarce any of the gems in beauty, and, in the fineſt ſpecimens, is of the ſame hardneſs, and of equal value with the ruby. It is found of various ſizes, from the bigneſs of a ſmall vetch to an inch and an half in diameter, and often to much more than that in length; it is as various in ſhape as the diamond and ſome other of the gems; it is not unfrequently found in a roundiſh or pebble-like form, ſometimes a little longiſh, and often thicker at one end than the other, and reſembling, in ſome ſort, a pear; it is in theſe ſhapes ſometimes equally rounded every way, but more frequently it is flatted on one

one ſide, and often has very ſmall and very bright faces on ſeveral parts; though this is no unuſual form to meet it in, its more common appearance, however, is in a cryſtalli-form figure, being found adhering by its baſe to ſtony matter, and either cruſting over the cracks, fiſſures, and ſtrata, of ferrugineous ſtones, or coating the inſides of large ferrugineous nodules, reſembling thoſe hollow flints we every day ſee in England, coated within with common ſmall pellucid cryſtals in theſe nodules. The Amethyſt always aſſumes the form, either of a ſhort and thick column of four planes, terminated by a flat and ſhort pyrymid of the ſame number of ſides, or the very figure of our common hexangular cryſtal, and ſometimes that of a long pyramid, without any column adhering to the matter of the nodule by its baſe; in the columnar ſhape, it makes the gayeſt figure, but, in the pebble-like maſſes, it is always the hardeſt and moſt valuable.

Amethyſt may be counterfeited with glaſs, to which the proper colour or ſtain is given. There were fine ones made in France, about the year 1690, which may even impoſe on connoiſſeurs, unleſs the ſtone be taken out of the collet.

The method of giving this colour to glaſs is as follows: Take cryſtal-frit made with the moſt perfect and fine tarſo, then prepare a mixture of manganeſe, in powder, one pound; zaffer prepared, one ounce and an half; mix theſe powders well together, and add, to every pound of the frit, an ounce of this powder. Let it be put into the pots with the frit, not into the already made metal. When the whole has ſtood long enough in fuſion to be perfectly pure, work it into veſſels, and they will reſemble the colour of the Amethyſt.

Joſt AMMON, marked his pieces with much ſuch a mark as in plate I. N°. 7.

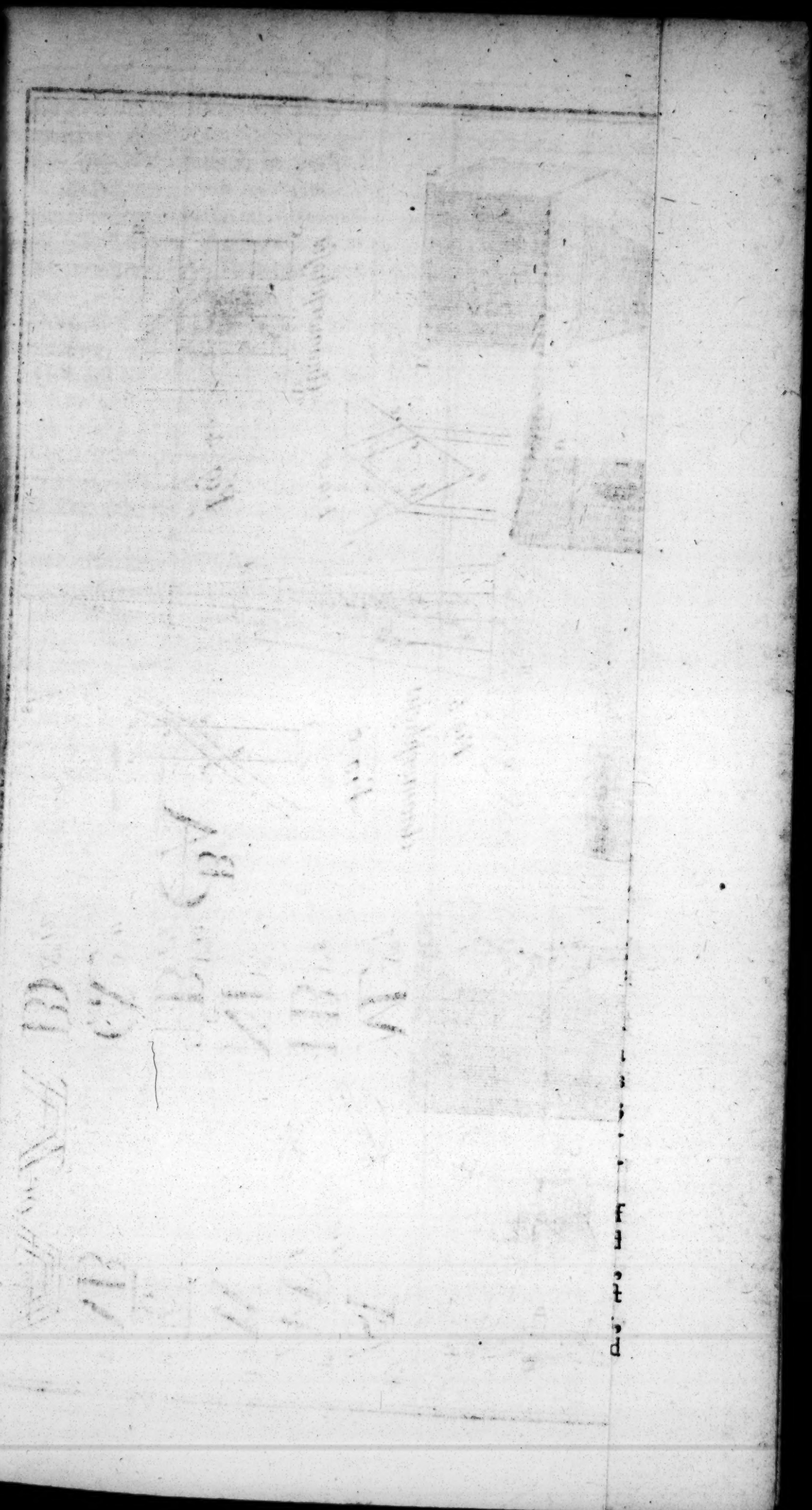
AMMONIAC, as gum Ammoniac, or, as it is ſometimes, though improperly, called Armoniac, is a kind of gum brought from the Eaſt-Indies, and is ſuppoſed to ooze from an umbelliferous plant.

Pliny calls the tree or plant whence it flows metopion, and ſays, the gum takes its name from the temple of Jupiter Ammon, nigh which the tree grows.

Dioſcorides ſays, it is the juice of a plant, a kind of ferula that grows in Barbary; and that the plant which produces it, is called agaſyllis.

In the choice of Ammoniac, chuſe that which is of a high colour, and not mixed with any ſcrapings of wood, ſtone, or ſand, which is called θραῦσμα, i. e. fraiture: The other, which is full of ſtones or ſand, is called φύραμα, i. e. mixture.

Sal



Facing P. 13. Fig. 6.

Plate. I.

Camera Obscura

Fig. 1.

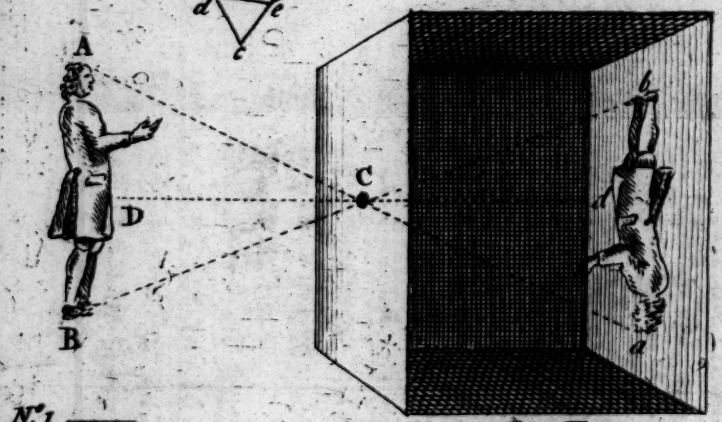


Fig. 2.

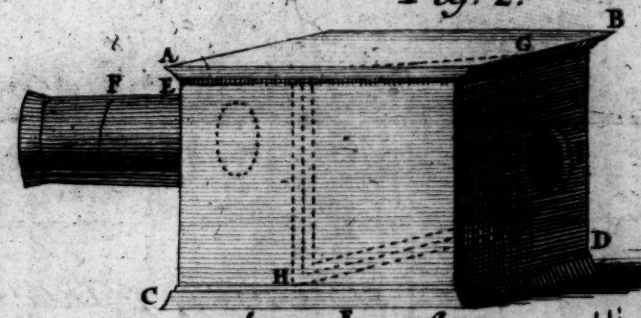
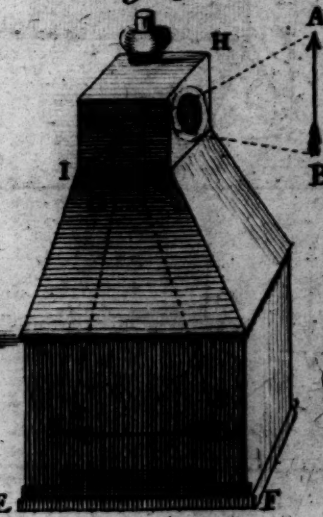


Fig. 3



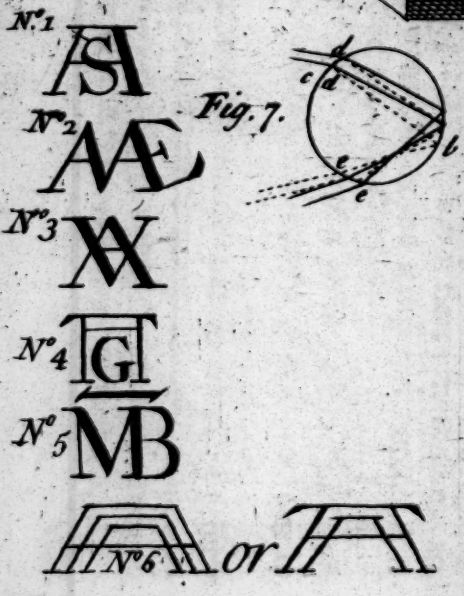
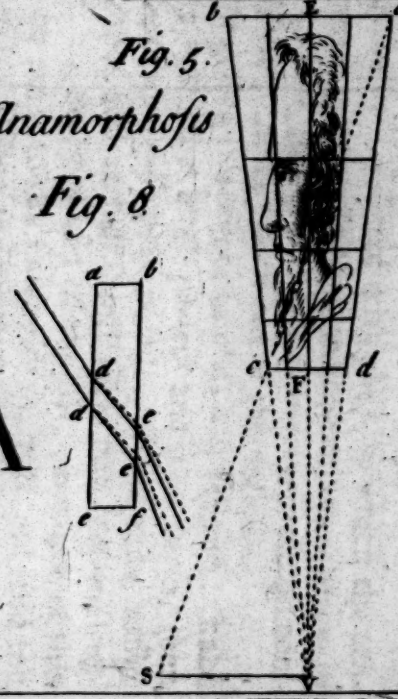


Fig. 7.

Fig. 5.

Anamorphosis

Fig. 8



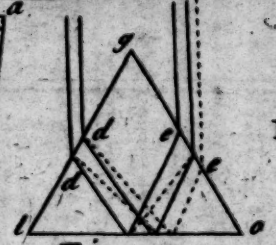


Fig. 9.

Anamorphosis



Fig. 4.

Sal AMMONIAC, is a kind of ſalt more uſually written Armoniac; which ſee.

ANAMORPHOSIS, in perſpective and painting, a monſtrous projection; or a repreſentation of ſome image, either on a plane or curve ſurface, deformed; which, at a certain diſtance, ſhall appear regular, and in proportion.

To make an Anamorphoſis, or monſtrous projection, on a plane.

Draw the ſquare A B C D (plate I. fig. 4, 5.) of a bigneſs at pleaſure, and ſubdivide it into a number of leſſer ſquares.

This ſquare or reticle is called the craticular prototype. In this draw the image that is to be rendered diſtorted and monſtrous.

Then draw the line $a\,b = A\,B$; and divide it into the ſame number of equal parts, as the ſide of the prototype A B; and erect the perpendicular E V in the middle of it, ſo much the longer; and draw V S perpendicular to E V, ſo much the ſhorter, as you would have the image be diſtorted.

From each of theſe diviſions draw right-lines to V, and join the points *a* and S, as alſo the right-line *a* S, through the points *d*, *e*, *f*, *g*, draw lines parallel to *a b*, then will *a b c d* be the ſpace that the monſtrous projection is to be delineated in, which is called the craticular ectype.

Laſtly, in every ſmall trapezium, or ſquariſh figure of the ſpace *a b c d*, draw what appears delineated in the correſpondent trapezium of the ſquare A B C D.

By this means you will attain a deformed image, which yet will appear in juſt proportion to an eye diſtant from it, the length E V, and raiſed above its height V S. It will be diverting to manage it ſo, that the deformed image do not repreſent a mere chaos, but ſome other image: Thus it has been contrived, that a river, with ſoldiers, waggons, &c. marching along the ſide of it, has been ſo drawn, that, when viewed by an eye in the point S, it appeared to be the ſatyrical face of a man.

An image alſo may be diſtorted mechanically, by perforating it here and there with a needle, and placing it againſt a candle or lamp; and obſerving where the rays, which paſs through theſe little holes, fall on a plane or curve ſuperficies; for they will give the correſpondent points of the image deformed; by means of which, the deformation may be compleated.

Henry ANDERSON, was a face-painter, and a diſciple of Streater, in great eſteem about the year 1660, which he did not long ſurvive; he drew the beautiful ducheſs of Richmond, which recommended him to draw king Charles II. and moſt of his court. He interfered in his buſineſs with Sir Peter Lely,

and

and had a great ſhare of reputation in thoſe times; he was likewiſe a landſcape-painter, and in ſtill life; as alſo a good imitator of his maſter, Serjeant Streater, till he left his way, and fell to face-painting.

ANDREW ANDREANI, of Mantua; he made uſe of the two marks on plate I. N°. 8, 9; he engraved on wood a tre tagli, or the croſſings in his ſhades; the ſecond mark is found in the croſſings of Julius Cæſar, in ten ſheets, engraved in 1699, and was invented by Andrew Mantegna, who alſo engraved on copper.

ANEMONIES [the way of painting them in miniature] of this flower there are many ſorts, as well double as ſingle, which laſt are commonly plain, and are either purple with purple and white, ſhaded with the ſame colour, ſome bluer ſome redder, ſometimes very pale, and ſometimes very deep.

Others are coloured with lake and white, and finiſhed with the ſame, by diminiſhing the white, or even uſing none at all.

Others, again, are coloured with vermilion, and ſhaded with the ſame colour, and deepened with carmine.

Others are white and lemon colour. Theſe laſt are done with maſticote, and both the one and the other muſt be ſhaded and finiſhed, ſometimes with vermilion, and ſometimes with a very deep lake, eſpecially at the bottom of the cup, about the ſeed, which is alſo often of a blackiſh colour, which is imitated with indigo, or with black and blue, mingling, in ſome, a little biſtre, and working continually with fine ſtrokes, and ſcumbling the ſhades into the lights.

There are ſome that have the bottom of the cup much brighter than the reſt, and even ſo as to be quite white, although the reſt of the Anemony be deep.

The ſeed of all theſe Anemonies is imitated with indigo and black, with a very little white; ſometimes it muſt be heightened with maſticote.

Double ANEMONIES, are of very various colours; but the fineſt of them have their largeſt leaves ſtriped.

Some of theſe ſtripes are performed with vermilion, to which is added carmine to finiſh them, ſhading the reſt of the leaves with indigo.

For the ſmaller leaves within, lay on a mixture of vermilion and white, and ſhade with vermilion mixed with carmine, and here and there be very ſtrong, particularly in the heart or cabbage, near the great leaves on the ſhady ſide, and finiſh with hair ſtrokes of carmine, which muſt humour the ſtripes, and turn of the leaves.

The ſtripes of others are coloured and finiſhed with carmine only, as well as the inner or ſmaller leaves; but yet obſerving

to

o leave a little round in the midſt of theſe laſt, where a deep urple or violet muſt be laid, which muſt be ſcumbled into the eſt; and, the whole being finiſhed, lay on broad ſtrokes of his ſame colour around the ſmaller leaves, eſpecially on the ark ſide, and ſcumble them into the greater, which muſt for he reſt be ſhaded with indigo and black.

In ſome others, the ſmaller leaves are of lake or purple, although the ſtripes of the greater are carmine.

There are others whoſe ſtripes are carmine in the middle of moſt of the large leaves, with vermilion under it in ſome places; ll which muſt be ſcumbled into the ſhades of the ground, which are of indigo and white.

The ſmaller leaves are laid in with maſticote, and are ſhaded with a very deep carmine on the light ſide, leaving here the maſticote almoſt to itſelf, and only dividing the leaves with a ine touching of orpiment and carmine, which ſmaller leaves nay be ſometimes ſhaded with a very little pale green.

There are double Anemonies all red, and of a violet colour; the firſt are coloured with vermilion and carmine, with carce any white, and are ſhaded with carmine alone, well gummed, that they may be very deep; purple Anemonies are imitated with purple and white, and are finiſhed without white.

In ſhort, there are of all colours of theſe double Anemonies, as well as of the ſingle, which are to be painted by the rules here ſuggeſted.

The green of both the one and the other muſt be verditer, mixt with maſticote for the dead colouring, and it muſt be finiſhed with bladder green.

Their ſtalks incline to be a little reddiſh; therefore they are to be ſhaded with carmine, and ſometimes with green after they are laid in with maſtico.

Filippo ANGELI, called *Napolitani*, imitated Michael Angelo Caravaggio, lived at Rome, Naples, and Venice, excelled in battles and landſcapes, died in the year 1609, aged forty years.

Philippo d' ANGELO, a Roman, born in the year 1570. He practiſed for the moſt part in battles and landſcapes, died at Venice anno ætat. 40.

Michael ANGELO PACE, born 1610, and called *Campidoglio*, was a diſciple of Fioravanti, and very much eſteemed all over Italy, for his admirable talent in painting fruit and ſtill life. He died at Rome anno 1670, leaving behind him two ſons, of whom Gio Battiſta was brought up to hiſtory-painting, under Franceſco Mola.

Michael ANGELO BUANOROTI, of noble deſcent, born in the year 1474, ſcholar of Dominico Ghirlandaio,

lived

lived at Florence and Rome, excelled in hiſtory-painting, ſculpture, and architecture, died in the year 1564, aged ninety years.

Michael ANGELO CERQUOZZI, called *Dalle Battaglie*, born in 1600, ſcholar of Antonio Salvatti, a Bologneſe, lived at Rome, excellent for battles and fruit, died in the year 1660, aged ſixty years.

ANGER, is a turbulent agitation, excited in the appetite by grief and boldneſs; by which the ſoul is retired into itſelf, to avoid the injury received, and at the ſame time is raiſed againſt the cauſe of the injury, to be revenged of it.

All the motions are therefore very great and violent, and all the parts agitated; the muſcles muſt be very apparent, bigger and more ſwelled than ordinary, and the vains and nerves ſtrained.

How Anger is repreſented in drawing and painting, ſee plate II.

ANGER, is repreſented in painting by a young man, round ſhouldered, his face bloated, ſparkling eyes, a round brow, a ſharp noſe, wide noſtrils; he is clad all in red, his creſt is a boar's head; from which iſſues fire and ſmoke; he holds in one hand a drawn ſword; and in the other a lighted torch.

He is repreſented young; becauſe youth is prone to Anger. The boar is an animal much inclined to wrath; the ſword ſhews, that Anger preſently lays hold of it; the cheeks pufft and bloated, intimate, that Anger often alters the face, by the boiling of the blood; and inflames the eyes.

Gum ANIMÆ, } a kind of gum or roſin, of which there
Gum ANIMI, } are two ſorts, the oriental and occidental.

The oriental gum Animæ, is diſtinguiſhed into three ſorts; the firſt is white, the ſecond blackiſh; in ſome reſpects like myrrh; the third pale, reſinous, and dry.

The occidental flows from an inciſion in a tree growing in New-Spain, called there courbati; it it tranſparent, and of a colour like to that of frankincenſe. Its ſmell is very agreeable, and it eaſily conſumes in the fire: All the ſeveral kinds are uſed in perfumes, by reaſon of their charming ſmell; but bdellium is frequently ſold inſtead of it.

ANNEALING, commonly called *Nealing*, is a term uſed for the preparing of ſeveral matters, by heating or baking them in an oven, or the like.

ANNEALING *of Glaſs*, is the baking of it, to dry, harden, and give it the due conſiſtence, after it has been blown and faſhioned into the proper works.

This is uſually performed in a kind of tower, called the Leer, built over the melting furnace. Annealing or nealing of glaſs,

glaſs, is commonly uſed for the ſtaining of glaſs with metal colours.

ANNEALING *of ſteel*, is the heating it in the fire to a blood-red heat, and then taking it out, and letting it cool gently of itſelf.

This is done to make it ſofter, in order to engrave or punch upon it.

ANTICS } (of *Antes*, L.) buttreſſes, &c. forming a
ANTIQUES } general or irregular compoſition of men, beaſts, birds, fiſhes, flowers, and ſuch-like, without either rule or reaſon; this muſt be a continuation of one and the ſame work, through the whole piece, without change or alteration.

ANTIQUE, ancient; the term is chiefly uſed by ſculptors, painters, and architects, who apply it to ſuch pieces of ſculpture, painting, and architecture, &c. as were made at the time, when the arts were in their greateſt perfection among the ancient Greeks and Romans, viz. from the age of Alexander the Great to the time of the emperor Phocas, when Italy became over-run by the Goths and Vandals. In this ſenſe, the word is the contrary of modern. Thus we ſay, the Antique manner, the Antique taſte, an Antique buſt, &c. It is ſometimes even contradiſtinguiſhed from ancient, which denotes a leſſer degree of antiquity, when the art was not in its utmoſt purity.

ANTIMONY, is a mineral ſubſtance of a metalline nature, having all the ſeeming characters of a real metal, except malleability.

It is properly called a ſemi-metal; it being a foſſile glebe, compoſed of ſome undetermined metal, combined with a ſulphureous and ſtony ſubſtance.

Antimony is found in mines of all metals; but chiefly in thoſe of ſilver and lead; but that, found in gold mines, is uſually eſteemed the beſt. There are alſo particular mines of it, as thoſe in Hungary, Tranſylvania, Germany, and in ſeveral provinces of France.

It is found in clods or ſtones of ſeveral ſizes, bearing a near reſemblance to black-lead, except that it is lighter and harder; and thence it is called marcaſite of lead; and its metalline part is ſuppoſed to be of that ſpecies.

Antimony has ſomething particular in its texture, being full of little ſhining veins or threads, like needles, brittle as glaſs. Sometimes it has veins of a red or golden colour intermixed, which is called male Antimony; as that, which has not theſe ſpecks, is called female.

It will fuſe in the fire, though not without ſome difficulty, and diſſolves more eaſily in water.

After it has been dug out of the earth, it is put into large crucibles, and fuſed with a violent fire, and afterwards poured into cones or antimonial horns; which is the common or crude Antimony of the ſhops; the apex of which is always the beſt and pureſt part, as the baſis or broadeſt part is the fouleſt.

The uſes of Antimony are numerous and important. It is mingled with tin, to make it white and harder; and with bell-metal, to render the ſound more clear; and is a common ingredient in ſpecula, or burning concaves, ſerving to give them a finer poliſh. It is a general aſſiſtant in melting of metals.

A. P. M. A. ſignifies *Abbas Primaticcius, inv. Marc Anthony, exc.* This mark is found in a plate, repreſenting a ſhepherd lying under a tree; and another holding his hand on an univerſal planiſphere.

APPARENT *Magnitude*, of any object, is the magnitude thereof, ſuch as it appears to the eye.

APPARENT *Place*, of any object, in optics, is that wherein it appears, when ſeen through one or more glaſſes; the Apparent place is different from the real one; for when, by refraction through glaſſes, that pencil of rays which falls on the pupil of the eye, from each point of any near object, is made to flow as cloſe together as that which comes from a diſtant one; or when, by the ſame means, the rays, coming from diſtant objects, are made to diverge as much as if they flowed from near ones; then the eye muſt neceſſarily ſee the place of the object changed, which change is its Apparent place.

APPEARANCE, in perſpective, is the repreſentation or projection of a figure or object upon the perſpective plane.

The Appearance of an objective right-line is always a right-line.

Direct APPEARANCE, in optics, is the view or ſight of an object by direct rays, without either refraction or reflection.

APELLES, according to Pliny, ſurpaſſed all that ever went before him, or came after him; and was born in the 112th Olympiad, after the building of Rome 420 years, and 324 before Chriſt.

Strabo ſays he was born in Epheſus, where he put himſelf apprentice to Pamphilus.

APOLLO, is repreſented as a young man, without a beard, and rays of light about his head, having, in one hand, a harp and the three graces, and in the other a ſhield and arrows.

He is alſo repreſented with long curled hair, crowned with laurel, in a purple robe, holding a ſilver bow in his hand, and placed on a throne of emeralds. He was ſtiled the god of wiſdom, phyſic, muſic, and learning.

APPREHENSION, is repreſented, in painting, by a young

lady of a middle ſtature, cloathed all in white; briſk and active, diſpoſed to liſten to another ſpeaking; having in one hand a cameleon, and in the other a mirrour.

Her youth denotes her aptneſs to apprehend and learn; the ſame is intimated by her middle ſtature; for the upper rooms are always worſt furniſhed, is uſually ſpoken of a very tall perſon. Her white cloathing is, becauſe white is the ground of all colours; ſhe, being on tiptoe, ſhews her being in readineſs to learn and underſtand; the glaſs intimates, that ſhe imprints things on herſelf, and makes all ſhe hears and ſees her own.

APRIL, is repreſented like a young man in green, adorned with a garland of myrtle, and hawthorn buds, winged, holding in one hand primroſes and violets, and in the other the zodiac ſign Taurus.

AQUA-FORTIS, is a corroſive liquor, uſed as a menſtruum for diſſolving ſilver and all other metals, except gold.

AQUA-FORTIS, is principally extracted from ſalt-petre, which is the only ſalt that will act on ſilver.

In preparing AQUA-FORTIS, either ſand, alum, or vitriol, is mixed, or the two laſt together with ſalt-petre, and then diſtilled by a violent fire, and the fumes being caught, condenſing in the receiver, become the Aqua-fortis.

If ſome of theſe matters are not added to the nitre, it will run too readily, and ſo prevent the evaporation; but, the fuſion being prevented, the parts of the ſalt, receiving more violent impreſſions from the fire, are converted into a volatile ſpirit.

Hence to try, whether or no Aqua-fortis be pure, put a grain of a ſolution of ſilver in Aqua-fortis into a like quantity of the water, and if the ſolution remains without either the water's turning milky, or the ſilver precipitating, the Aqua-fortis is pure.

Dyers uſe it in dying ſcarlet, &c. refiners for parting or ſeparating ſilver from gold or copper.

Alſo for colouring of bone, ivory, &c. which is done by ſteeping the things therein, after they have been firſt tinged with copperas or verdigreaſe.

Some alſo turn it into Aqua regia, by diſſolving in it a fourth part of its weight of ſal armoniac, and then ſtain therewith ivory hafts and bones of a fine purple colour.

Book-binders alſo throw it on leather, and ſo marble the covers of books.

Diamond-cutters alſo uſe it, to ſeparate diamonds from metalline powders.

It is alſo uſed in etching on copper or braſs plates.

Mr. Boyle tells us, he has cauſed canes to be ſtained like tortoiſe-ſhell, by laying on them a mixture of it with oil of

vitriol ſeveral times, over live coals, to cauſe it to penetrate the deeper, and afterwards giving them a gloſs with a little ſoft wax and a dry cloth.

AQUA-FORTIS is of various and extenſive uſe to workers in moſaic, for ſtaining and colouring their woods.

There are ſeveral ſorts of Aqua-fortis, prepared after different manners, appropriated to the different uſes they are deſigned for; but all of them always with ſalt-petre or nitre, which is the principal ingredient in Aqua-fortis.

This which follows, is one of thoſe that has a peculiar compoſition.

Take one pound of nitre, or ſalt-petre refined; three pounds of roch allum, calcined on the fire-ſhovel; and four ounces of cryſtalline arſenic; reduce all into a fine powder, to which add ſeven ounces of fine ſand (but Neri ſays lime) and, having well mixed the whole compoſition, put it into a glaſs cucurbit, always leaving one third part of it empty; two thirds being filled, lute the cucurbit well with a ſtrong lute, which is to be made as follows:

Take one part of loam (a fat earth) which is found in rivers, three parts of ſand, of common wood-aſhes well ſifted, of the ſhearings of woollen cloth, each half a pound; mix the whole well together, and, putting water to them, make a ſoft paſte; to which add one third part of common ſalt powdered, and work them all well together, and then uſe them in luting your veſſels.

But, before you put the cucurbit or body on, you muſt lay ſand four inches deep, and thick iron bars, to bear the weight, then fit a head, and cloſe the joints well with a lute made of fine flour, and lime powdered, and mixed with whites of eggs: Then put on the joints, rollers of fine linen, then lute it again, and put on linen rollers again, three or four times, each time letting it dry before you put on the next roller, and then this will bear the violence of the fire, and the penetrating force of the ſpirits of the Aqua-fortis.

After that, you muſt put this body of the alembic in a deep earthen pan, made of the ſame earth as crucibles, filled with ſand, ſo that it be buried in the ſand, within two inches of the joints; then ſet it in a wind-furnace, fit and capable to maintain an equal fire. See the article FURNACE.

Your alembic being thus fitted, you muſt fit to the head a glaſs receiver very capacious, the better to reſiſt the force of the ſpirits, otherwiſe all may break.

Lute it well to the mouth of the alembic, as you did the joints before, and with the ſame precaution of letting it dry each time in the air, taking care not to kindle the fire in the furnace,

furnace, till the lute of all the joints be dry; for that is very neceſſary.

The whole being thus in right order, kindle a ſmall-coal fire for the ſpace of three hours, during which time, the windy particles, that are in the materials, and which would break them, will be drawn off into the receiver.

So continue a moderate fire for ſix hours, then increaſe it little by little, putting in, at laſt, billets of dry oaken wood to the coals for ſix hours more, till the alembic or head begins to be tinged yellow, and the ſpirits begin to riſe.

Obſerve to continue this regimen or degree of fire, till the head and receiver begin to grow red; then augment it till the alembic becomes of a deep red; continue this degree of the fire, as long as that colour laſts, till all the ſpirits are drawn off, and the head and receiver begin, by degrees, to grow clear, and re-aſſume their common colour in cooling; which, ſometimes, will be two days firſt.

Notwithſtanding, you muſt continue the fire two days afterwards, then let the furnace cool of itſelf; taking care, that while the alembic and receiver are ſtill red, and the fire in force, that you admit no cool air into the place, and that nothing cold touch them, which would break them.

When all is cold, cover the head and receiver with wet linen, that the ſpirits which are about the head and receiver, may the better ſink to the bottom of the receiver, and let it ſtand ſo for twelve hours.

Then bathe the joints and the luting with warm water, in order the better to looſen the bandage, and ſo take off the head from the receiver, otherwiſe it would be difficult to do it; then you may break the body, which will be good for nothing, and take out the fæces, which reduce again to powder.

Add to each pound of that powder four ounces of refined nitre, and put the whole into a cucurbit, or body, on which pour all the Aqua-fortis, before diſtilled; then put on the head and receiver, and lute it and dry it well, as you did before, having put it on the ſame ſand furnace; during the firſt four hours make a gentle fire, which afterwards may be increaſed by little and little, till the head and receiver begin to grow clear, and all the ſpirit is drawn over.

After which, let all cool, covering the head and receiver with wet cloths, and let it ſtand twelve hours, as before. Then unlute the joints again with warm water, and put the Aqua-fortis into glaſs veſſels, well ſtopped, that the ſpirits may not exhale, and keep it for the uſes hereafter mentioned.

This is the Aqua-fortis called water of ſeparation, and the beſt that can be made.

There are ſome, who, inſtead of roche allum, take the beſt Roman vitriol, or the like.

You may know whether the vitriol be proper for this uſe or not, by rubbing it on a piece of well poliſhed iron; if it be, it will leave a copper colour on it; then this vitriol will make an Aqua-fortis far more penetrating than the former. See the purification of this vitriol, under the article VITRIOL.

AQUA *Marina*, a gem or precious ſtone, of a ſea-green colour. It is found along the coaſts, and is ſaid to vie with the amethyſt in hardneſs.

Some critics have contended for its being the ſixth ſtone in the rationale of the Jewiſh high-prieſt; called, in the Hebrew, tharſis, which has been rendered in the Latin, beryllus, and by others, chryſolithus; ſeveral lapidaries take it for the beryl.

AQUA *Mercurii*, to make. Take putty, or tin calcined very fine and pure, one ounce; quickſilver purified, two ounces; mix them, and make an amalgama: Waſh this with fair water till it comes off clear and colourleſs; then dry it perfectly, put it into a matraſs, with ſuch a degree of heat as is neceſſary for ſublimation: When it has been ſublimed and is grown cold, take out the ſublimate; to which add an ounce of Venetian corroſive ſublimate; grind them well together on a porphyry, then put them into another matraſs, cloſe it very well, and ſink it all over in a veſſel of water; ſo, in a ſhort time, the whole maſs will be reſolved into water: Filtre this into a glaſs receiver, and coagulate on a gentle ſand-heat to a cryſtalline ſubſtance; reduce this in a mortar to a very fine powder, and ſearce it through a fine ſieve, put it into a matraſs, ſtop it well, and digeſt in balneo mariæ, to be reſolved into water, which keep for uſe, in making artificial pearls, &c.

AQUA *Regalis*, } is nothing but a common Aqua-fortis,
AQUA *Regia*, } wherein one-fourth of its weight of ſal-armoniac has been diſſolved.

But, in order to have a good and ſtrong Aqua regalis, you muſt take one pound of Aqua-fortis, prepared as directed, and put it into a glaſs matraſs; and add to it only two ounces of ſal-armoniac, then ſet the matraſs into a warm bath, or pan of warm water, and ſtir it often, that the ſal-armoniac may be well diſſolved in the Aqua-fortis; which will be tinged of a yellow colour.

Then you muſt add as much ſal-armoniac to it as the Aqua-fortis can diſſolve, then let it ſettle a little, and the ſal-armoniac will leave at the bottom all its earthy parts.

After that decant it gently off into another veſſel, ſo as not to diſturb the ſettling at the bottom, or rather filtre it through whited-brown paper.

This

This water will diſſolve gold and other metals, far better than the common Aqua regalis, except ſilver, which it toucheth not at all, for reaſons which chymiſts are acquainted with.

Gum ARABIC, is the name of a gum which diſtils from a a ſpecies of acacia, growing in Arabia and Egypt.

It is very common among us, but little is to be met with that is genuine; it is ſuſpected to be adulterated with our common plum-tree gums.

That is accounted the beſt, which is in ſmalleſt pieces, and almoſt of a white colour.

ARCHITECTURE, is repreſented, in painting and ſculpture, by a woman ſitting upon a piece of a pillar, having all ſorts of tools and inſtruments about her, looking earneſtly upon a draught or deſign, which lies in her lap; behind her a perſon repreſenting reaſon, looking likewiſe upon the draught, on her head a helmet, in her left hand Pallas's ſhield, and in her right-hand Mercury's caduceus.

ARCHITECTURE *Military*, is repreſented in painting, &c. as a woman of ripe years, in a noble garment of divers colours, a gold chain about her neck, with a diamond in one hand, the mariners compaſs in the other, the deſcription of an hexagon fortification, a ſwallow on her fiſt, a pick-ax and ſpade at her feet. Her party-coloured veſtments denote the underſtanding of divers contrivances in this art; the golden chain and diamond denote durability and excellency; for fortifications are the beſt jewels of princes, ſecuring them from enemies; the ſwallow is remarkable for the artificial building her neſt.

ARDICES, the Corinthian, and *Telephanes*, of Sicyon, or *Crato*, of the ſame city, were the perſons, who made the firſt ſteps towards the advancement of painting.

Theſe began to add other lines, by way of ſhadowing, to their figures, which gave them an appearance of roundneſs and much more ſtrength. This manner was called graphice, but the advantages it brought to its inventors were ſo inconſiderable, that they ſtill found it neceſſary to write, under every individual piece, the name of whatever it was deſigned to repreſent, leſt, otherwiſe, the ſpectators ſhould never be able, of themſelves, to make the diſcovery.

ARGENTUM *Muſicum*, } a kind of liquid ſilver to write
ARGENTUM *Muſivum*, } with; take one ounce of tin, melt it, and put thereto tartar and quickſilver, of each one ounce; ſtir them well together until they are cold, then pound them in a mortar, and grind them with a ſtone and muller; mix the whole with gum-water, and you may write there with, and afterwards poliſh it.

ARISTOCRACY, is repreſented in painting as a lady in

the prime of her years, attired in a ſplendid habit, ſitting majeſtically in a chair of ſtate, a crown of gold on her head, holding in her right hand a bundle of rods bound together, and a garland of laurel, and, in her left, a head-piece; on her right-ſide is a baſon and a purſe full of gold and precious jewels, and on her left hand an ax.

ARITHMETIC, is painted in cloth of gold, or otherwiſe, as a beautiful lady, in garments of different colours, beſprinkled with muſical notes, and in the ſkirts is writen par and impar, even and odd; in her left-hand the numeration table.

Her handſomeneſs denotes the beauty of all things in number, weight, and meaſure; her perfect age ſhews the perfection of this art; the various colours ſhew, that ſhe gives principles to all parts of the mathematics.

ARMENUS *Bolus*, i. e. bole armoniac or ammoniac, a kind of earth brought from Armenia. It is of a pale-red colour, and partakes much of the nature of ſtone; but is ſoft, fat, friable, eaſily pulveriſed, and ſticks to the tongue.

This bole is eaſily falſified, and the merchants frequently ſell Lemnian earth inſtead of it.

Matthiolus ſays, it is found in gold, ſilver, and copper mines.

ARMONIAC, AMMONIAC, } is a ſort of volatile ſalt, of which there are two kinds, ancient and modern.

The ancient ſal Armoniac, called, alſo, ſal Cyreniac, deſcribed by Pliny and Dioſcorides, was a native ſalt, generated in the earth, or rather the ſands, in thoſe large inns or caravanſera's, where the crowds of pilgrims, coming from all parts to the temple of Jupiter Ammon, were wont to lodge. The way of conveyance being, in thoſe parts, commonly by camels; and thoſe creatures, when in Cyrene, a province of Egypt, wherein that celebrated temple ſtood, urining in the ſtables, or, as ſome ſay, in the parched ſands: Of this urine, which is remarkably ſtrong, ſublimed by the heat of the ſun, aroſe a kind of ſalt, ſometimes called Ammoniac, and ſometimes Cyreniac, from the region.

This ſalt being no longer found in theſe parts, ſome authors ſuſpect there never was any ſuch thing; and that the ancient, as well as the modern ſal Armoniac, was factitious.

The modern ſal Armoniac is compound and factitious.

The public has been for a long time at a loſs, both as to the place from whence it comes, and how it was made; all that was known for certain, was, that it came from the Levant.

But Sicard, the jeſuit, ſays, it is made in Egypt, in a ſort of ovens, contrived for the purpoſe, the tops of which are perforated with ſeveral longitudinal clefts; and on theſe clefts are

laid ſeveral long-necked glaſs bottles, filled with ſoot, a little ſea-ſalt, and the urine of cattle, well ſtopped.

Theſe are covered up with a body of clay and brick, all but the necks, which lie open to the air; and then, the fire being put into the oven, it is kept up for three days and three nights ſucceſſively.

The phlegm of the materials contained in the bottles being thus exhaled by the heat of the fire, and the acids and alcaline ſalts abounding therein being thus brought together, near the necks of the bottles, they coaleſce, harden, and form a whitiſh maſs, which is the ſal Ammoniac.

ARROGANCE, is painted in the perſon of a lady cloathed in a green garment; with aſſes ears, holding under her left-arm a peacock, and extending the right-arm, points with her fore-finger.

Arrogance, aſcribes to itſelf what is not its own, therefore, it has the ears of an aſs, for this vice proceeds from ſtupidity and ignorance; the peacock intimates the putting a value upon one'ſelf, and deſpiſing others.

ARSENIC, is a ponderous mineral ſubſtance, extremely cauſtic or corroſive, to the degree of a violent poiſon.

There are divers kinds of Arſenic, viz. yellow, or native red, and cryſtalline.

Native Arſenic, is of a yellow or orange colour; whence it is alſo called auripigmentum or orpiment.

It is chiefly found in copper mines, in a kind of glebes or ſtones, of different ſizes and figures.

As to the colour, though it is always yellow, yet admits of divers ſhades and mixtures, as a golden-yellow, reddiſh-yellow, green-yellow, &c.

It is found to contain a ſmall quantity of gold, but ſo little as not to quit the coſt of ſeparating. Of this are prepared two other ſorts of Arſenic, white and red.

Red Arſenic, called realgal, is only the native yellow, rubified by fire.

The white or cryſtalline, is drawn from the yellow by ſubliming it with a portion of ſea-ſalt.

White and yellow Arſenic, are alſo procurable from cobalt; the method of which, as practiſed in Hungary, is as follows:

The cobalt being reduced to powder, and the light ſandy part waſhed off by a current of water, what remains is put into a furnace; the flame of which, paſſing over the powder, takes the arſenical part along with it, in form of a ſmoke; which being received by a chimney, and carried thence into a cloſe brick channel, ſticks by the way to the ſides, and is ſcraped

off

off in form of a whitiſh or yellowiſh powder. From what remains of the cobalt, they proceed to make ſmalt.

The ſmalleſt quantity of any of theſe Arſenics, being mixt with any metal, renders it friable, and abſolutely deſtroys its malleability.

Hence the refiners dread nothing ſo much as Arſenic in their metals; nor could any thing be ſo advantageous to them as a menſtruum, that would abſorb or act on Arſenic alone; for then their metals would be readily purified, without flying off or evaporating.

A ſingle grain of Arſenic will turn a pound of copper into a beautiful ſeeming ſilver; this hint many perſons have endeavoured to improve on, for making of ſilver; but in vain, becauſe it could never be brought to ſuſtain the hammer; and ſome have been hanged for coining ſpecies of this ſpurious ſilver.

Of the colour of the beſt ASHES. The colour of the beſt Aſhes is a fine blue or ſky colour. The manner of examining the colour is as follows, viz. by throwing a piece of very fine white cloth or crape over the Aſhes; and if the Aſhes appear of a beautiful blue through the thin cloth, and the whiteneſs of the cloth plainly appears as ſpread over the Aſhes; it is a ſatisfactory proof that the Aſhes are the beſt and fineſt.

This ſort of Aſhes is uſed in the linen manufacture in Brabant, and by the thread bleachers; this is generally the ſcarceſt ſort, and bears the higheſt price, and is not only fit to give a luſtre to linen, but is proper for all other manufactures, could it be had in great plenty.

To dye cloth, &c. ASH *Colour.* To dye a piece of fifteen ells of cloth, &c. of an Aſh colour, firſt dye it a ſky colour, with woad and indigo; then rinſe it out clean, and dry it; then apply the following black: Take four ounces of beaten galls; one drachm of burnt alum; half a pound of vitriol; boil the dye, and the ſtuff in it, for half an hour; then paſs it through, and rinſe it; then add to the ſuds three ounces of braſil, that has been before boiled in a ſkillet in part; three quarts of ſharp lye; half an ounce of rock ſalt or ſal gemmæ, and you will have a beautiful Aſh colour.

You may alſo prepare this colour brighter with galls; but, if the luſtre be not good, when taken out of the woad or indigo copper to try, then add four ounces of ſumach; ſix ounces of vitriol; three ounces of madder; three ounces of ſalt; half an ounce of burnt alum.

But the firſt Aſh colour is the more beautiful and laſting.

Another method of dying ASH *Colours.* Take a ſufficient quantity of water; nut-galls, bruiſed ſmall, eight ounces; madder, two ounces; put all into the veſſel, and let them boil; then enter

er twenty yards of broad cloth, and handle it, letting it boil wo hours; then cool it, and put in copperas two ounces, and hen enter the cloth again, and handle it; then let it boil a quarter of an hour, and cool it. If you would have it ſadder, you muſt put in more copperas.

Note, That handling of it ſignifies to roll it on the roller, s it is boiling, and to let it all in again, to hinder its ſpotting, nd to make it take colour equally. Cooling it ſignifies to ake it up and air it.

To dye the beſt ASH *Colour.* Take fair water, a ſufficient quantity; red tartar, four ounces; nut-galls, three ounces; bruiſe them ſmall, and enter twenty yards of cloth, boil it an hour an half; then cool and ſadden it as you think fit.

Edmund ASHFIELD, a gentleman well deſcended, who drew both in oil and crayons; he was diſciple to Mr. Wright, and painted ſome heads as big as the life; he firſt found out the way to multiply the number and variety of teints in crayons, and therewith to draw various complexions, in imitation of oil-painting; this he performed on paper, and practiſed ſeveral years with deſerved applauſe; he ſold thoſe heads at ten pounds a-piece.

From him Mr. Luttrell had his inſtructions, who has improved that invention, and multiplied the variety of colours, to effect any thing; as alſo found out a method, unknown before, to draw with thoſe chalks or crayons on copper-plates, either after the life or hiſtorically.

ASIA, is repreſented in painting, &c. wearing a garland of various flowers, and fruits, clad in a rich veſtment embroidered; holding in her right hand branches with roots of caſſia, pepper, and cloves, and in her left hand a cenſer ſmoaking; and by her a camel on its knees.

The garland imitates, that Aſia produces delightful things, neceſſary for human life; her garment, the great plenty of thoſe rich materials; the bundle of ſpices, that ſhe diſtributes them to other parts of the world. The cenſer ſignifies the odoriferous gums and ſpices it produces; and the camel is a beaſt proper to Aſia.

*Michael L'*ASNE, engraved the rudiments of deſigns, and other plates, and uſed the mark. See plate I, N°. 10.

Double ASPECT, in painting, is uſed, where a ſingle figure is ſo contrived, as to repreſent two or more different objects, either by changing the poſition of the eye, or by means of angular glaſſes.

ASSIDUITY, is repreſented in painting, as an ancient woman, holding in both her hands an hour-glaſs, and on one ſide her is a rock, ſurrounded with a branch of ivy.

Her

Her age denotes that time and labour are continually deſtroying us; and ſhe therefore holds an hour-glaſs, which requires diligence in turning, and often moving it, leſt it ſtop.

ASSISTANCE, is repreſented in painting, &c. by a man in years, clad in white, and over all a purple mantle; a ray ſhining round him, crowned with a garland of olive; a chain about his neck, and a heart for a pendant; his right arm is extended, and his hand open; in his left hand he holds a ſtake, ſurrounded with a vine, and at his right is a ſtork.—His age intimates his diſcretion, not being intent upon avarice, in giving his helping hand.—The white raiment indicates his ſincerity, without ſelf-intereſt. The ſplendid ray denotes divine aſſiſtance, without which, as the wife without the huſband, it is like the vine without the ſtake; the ſtork, the natural affection of parents.

ART, is repreſented, in painting, by an agreeable woman, who ſeems to be ingenious by her very looks; ſhe is habited in a gown of green, holding in her right hand a hammer, an engraving tool, and a pencil, and in her left hand a ſtake, that ſupports a vine.—The agreeableneſs of her countenance declares the charming nature of Arts, attracting all eyes to it, and gaining the author's approbation and commendation; the three inſtruments are for imitating nature; the ſtake ſupplies nature's defects, in holding up the tender plant.

ARTIFICE, in painting, &c. is repreſented as a comely man, in a richly embroidered garment, laying his hand upon a ſcrew of perpetual motion, and by his right he ſhews a hive of bees.—He is nobly cloathed, becauſe Art is noble of itſelf; his hand upon the ſcrew ſhews, that engines have been contrived by induſtry, and by thoſe incredible things, like the perpetual motion, have been performed.—The hive intimates the induſtry of bees, which, being inconſiderable, are nevertheleſs great as to their conduct.

ASTONISHMENT, proceeds from an exceſs of admiration, which ſurpriſe is ſometimes ſo ſtrong, as to drive the ſpirits towards the place from whence the impreſſion of the object is received; and being ſo much employed in conſidering this impreſſion, that there remain no ſpirits to paſs through the muſcles; the body becomes immoveable as a ſtatue.

How this paſſion is repreſented in drawing and painting, ſee the figures of admiration and Aſtoniſhment in plate II.

ASTRONOMY, is painted with a ſilver creſcent on her forehead, an azure mantle, a watchet ſcarf, beſprinkled with golden ſtars.

It is alſo repreſented as a lady in a ſtarry habit, her eyes looking towards heaven; holding in her right hand an aſtrolabe, and in her left a table of aſtronomical figures.

Her

Her garments denote the night, the moſt proper to ſee the ſtars in; her eyes and thoughts always elevated, and intent upon celeſtial bodies; the aſtrolabe meaſures the diſtance of them; the table ſhews the difference of it from aſtrology.

ATTITUDE, of *Attitudo*, Italian, q. of *Aptitudo*, L. is, in painting and ſculpture, the poſture of a figure or ſtatue, or the diſpoſition of its parts, by which we diſcover the action it is engaged in, and the very ſentiment, ſuppoſed to be in the mind. See ACTION, FIGURE, STATUE.

The repreſenting theſe in a ſtrong and lively manner makes what is called a good expreſſion. See EXPRESSION.

AVARICE, is repreſented, in painting, by an old woman, pale-faced, lean and melancholy, afflicted with a pain, which makes her lay one hand upon her belly; yet ſeems to devour a purſe with her eyes, which ſhe graſps in the other, accompanied with an hunger-ſtarved wolf.—Her paleneſs proceeds from her envy, that torments her to ſee her neighbours richer than herſelf; her eyes are fixed on her purſe, it being her chief delight; the wolf denotes the voracious appetite of the covetous, who would have other men's goods by hook or by crook.

AUGURY. Good Augury is repreſented, in painting, by a young man, cloathed all in green, having a ſtar over his head, hugging a ſwan.—The green cloathing is a token of hope, and conſequently of good luck, becauſe greenneſs promiſes a plentiful crop; the ſtar denotes good ſucceſs, and a perſon not to be, as we ſay, born under a three-penny planet; the whiteneſs of the ſwan is alſo an emblem of fortunateneſs, as a black crow is of bad luck.

AUGUST, is repreſented by a young man, of fierce countenance, clad in a robe of flame colour; crowned with a garland of wheat ears; having on his arm a baſket of ſummer fruits, at his belt a ſickle bearing a virgin.

AURORA, i. e. the morning, is perſonated by poets and painters. Homer deſcribes her like a young virgin, having her hair diſhevelled, and hanging looſe about her ſhoulders; being of the colour of the pureſt gold, ſitting in a golden chair, with all her veſtments of that hue and colour.

Virgil deſcribes her, as coming, at the very inſtant of ſable night's departure, with one of her hands full of roſes, gilliflowers, and lilies, taken out of a baſket, which ſhe carries in her other hand, beſprinkling them on the marble pavement of the lower heaven, adorning the ſun with unſpeakable beauty.

She is alſo repreſented as a young virgin, with carnation wings, and a yellow mantle; in her forehead a ſtar, and golden ſun-beams from the crown of her head, riding upon Pegaſus;

with

with a phial of dew in one hand, and various flowers in the other, which ſhe ſcatters upon the earth.

She is alſo deſcribed, holding in one hand a flaming torch, and drawn in a gorgeous chariot, beſpangled with ſtars, by winged Pegaſus; which favour ſhe is feigned to have obtained from Jupiter by many importunate requeſts, preſently after the downfal of Bellerophon.

She is fabled to be the herald and meſſenger of Phœbus, and as receiving her being from the virtue of his beams; and is no other than that rubicund and vermilion bluſh, which appears in the eaſt, before the riſing of the ſun.

AURUM *Muſicum*, } a ſort of liquid gold for writing:
AURUM *Muſivum*, } Take fine cryſtal and orpiment, of each one ounce; pound them ſeverally, till they are reduced to a very fine powder; then grind them together well with glair.

With this you may write either with pen or pencil, and the letter or draught will be of a good colour.

AURUM *Sophiſticum*, mimic gold, a chymical preparation, made as follows: Take fine diſtilled verdigreaſe, eight ounces; crude Alexandrian tutty, four ounces; borax, twelve ounces; ſalt-petre, one ounce and a half; pulveriſe and mix them all together, tempering them with oil to the conſiſtence of a plaiſter; then put a German crucible into a wind-furnace; heat it red-hot, and, putting your maſs into it, let it be covered, and the furnace filled with coals over the crucible. When the maſs is melted, let it cool of itſelf; then break the crucible, and you will find at the bottom a fine regulus, like gold, weighing about four ounces, which, being malleable, may be wrought into any form.

AUTHORITY, is repreſented, in painting, like a grave matron, ſitting in a chair of ſtate, richly cloathed in a garment embroidered with gold; holding in her right hand a ſword, and in her left a ſcepter, and by her ſide is a double trophy of books and arms. Her age and gravity indicates Authority, as alſo do the throne, on which ſhe is ſeated, and the ſplendid habit, the pre-eminence perſons in Authority have over others; the ſword liſted up denotes ſovereign power, and the ſcepter is alſo an enſign of Authority.

AUTUMN, is repreſented, in painting, by a man at perfect age, cloathed like the vernal, and likewiſe girded with a ſtarry girdle; holding in one hand a pair of ſcales, equally poiſed, with a globe in each; in the other a bunch of divers fruits and grapes. The age denotes the perfection of this ſeaſon, when fruits are ripe. The balance, or libra, is one of the twelve ſigns of the zodiac, which denotes Autumn.

AZURE, a mineral colour, prepared from the lapis Armenus

us. Azure is very near of kin to ultramarine; being procured rom the Armenian ſtone, much after the ſame manner as the ther is from lapis lazuli. See LAPIS LAZULI.

To dye an AZURE *Colour.* Take roche allum, and filings f braſs, of each two ounces; fiſh-glue, half an ounce; vinegar r fair water, a pint; boil it to the conſumption of the half.

B.

B ſtands for John Sebald Beham. Abbot Primaticcio, who B. in France was called of Bologna, alſo uſed the letter B r his mark. So alſo did Il Bonaſoni, and Domenico Beccami, interſecting it with a line.

B. B. ſignifies Bartholomew Beham of Norimberg; he engraved at Rome, and in Bologna, with Mark Antonio Raimon-. The ſame letters were alſo uſed by Bartholomew Biſcano, Genoeſe painter, in ſuch plates as were of his own invention.

B. B. A. F. ſignifies Baccio Bandinelli, a Florentine architect.

BACCHUS, is painted with ſhort brown curled hair, cloathed ith either a leopard's ſkin, or a green mantle; a tawny face, ith a wreath of vine branches.

BACK *Painting*, metzo-tinto prints with oil colours.

This art conſiſts chiefly in laying the print upon a piece of ear Crown or Cock-hill glaſs, of ſuch a ſize as fits the print. e MEZZOTINTO *Prints.*

BAL. SEN. ſignifies Baldaſſer Senenſe, i. e. Baldaſſar Pezzi of Siena.

Hb. Hans BALDUNG or BALDUIN, in a plate, repreting horſes, engraved in 1534.

The ſame mark was uſed by Hans Broſamer, in his plates Curtius riding into the gulph; and in his Lacoon, and Samon worſhipping the idol. See plate I, N°. 11.

Horatio Borgiano alſo made uſe of the ſame mark in his ates, and ſometimes uſed an H and a B.

BALLS, *to take out ſpots of oil or greaſe.* Take ſoft ſoap, corporate it with the aſhes of vines, finely ſifted, of one as uch as the other; then add to it roche allum burnt and tar- finely powdered: Stir all well together, and form it into lls, with which you may take ſpots out of any garment.

Baccio BANDINELLI, born in the year 1487, ſcholar of io. Franceſco Ruſtici; lived at Rome, excelled in hiſtory-inting and ſculpture; died in the year 1559, aged ſeventy-o years.

BANTAM-*Work*, a kind of elegant work, and is both plain d emboſſed; and is wrought moſt in gold and other metals.

So

So the Bantam-work is alſo plain and carved, and is wrought moſt of it in colours, with a very ſmall ſcattering of gold here and there.

The wood is prepared for this work, the ſame as it is for the Japan-work, and the priming with whiting is the ſame: And, as to the flat work, it is done in colours, mixt with gum-water, as the nature of the deſign requires; the ordering which colours with the gum-water is taught in Japan-work, &c.

The carved work is performed after the following manner: Let either cabinet, tables, boxes, &c. be made of deal or ſome other coarſe wood; prime it with ſize and whiting, letting it dry; this muſt be ſo often repeated till the priming is almoſt a quarter of an inch thick, letting it ſtand to be thorougly dry between every time.

But you muſt take notice of this, that the whiting and ſize muſt be made thinner than for Japan-work, and for that reaſon it muſt be done ſo much the oftener; for, if it is too thick it will not only lie rougher, and be apt to crack and fly off; but it will not ſo eaſily penetrate to the bottom of any crack, nor go into any little crevice, notch or hole, as it will certainly do if it is pretty thin.

The piece being primed to its due thickneſs, and thorough dry, is in the next place to be water-plained, viz. to be rubbed with a fine rag, and a little fair water; after which, being dry, rub it as ſmooth as you can.

Then lay on the black, and varniſh it up with a good body; and, after it has ſtood to dry for ſix or ſeven days, poliſh it with tripoli, water, and a fine rag; rubbing it with an even, eaſy and gentle hand.

When this has been done, trace and draw out your deſign with fine cinnabar and gum-water, in the very ſame manner you deſign to cut and carve it, with all the circumſtantialneſs and exactneſs poſſible.

Make your human figures, birds, beaſts, and inſects, houſes, trees, flowers, rocks, &c. in their due meaſure and proportions; the foldings of garments, leaves of trees, and plants, and all other things, draw them ſo, as if they were ſo to remain without the leaſt alteration.

Then being provided with a ſharp graver, and other cutting inſtruments of different forms, cut out the work deep or ſhallow, as you think beſt, but taking care never to cut deeper than the whiting lies; for the wood itſelf ought not to be touched with the graver.

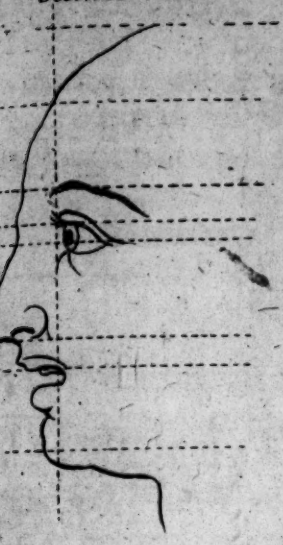
Alſo leave black ſtrokes for the drapery and folding of garments, and for the diſtinguiſhing of one thing from another; carving where the white is, and leaving the black untouched accord-

Admiration.

Facing P. 32.

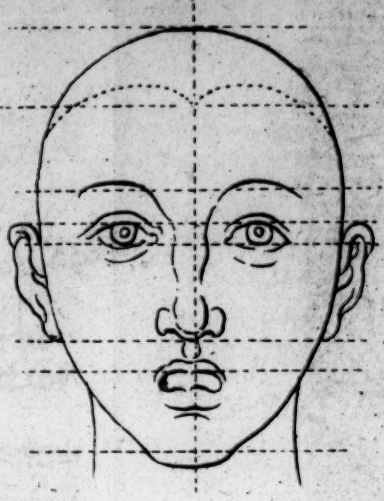
Plate. II.

Admiration.





Admiration.



Anger.



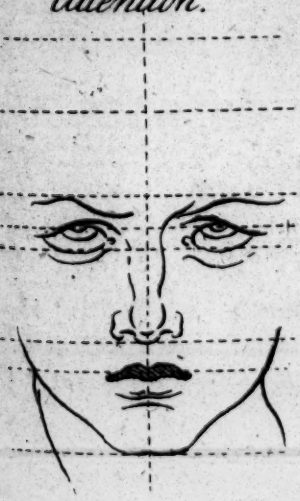
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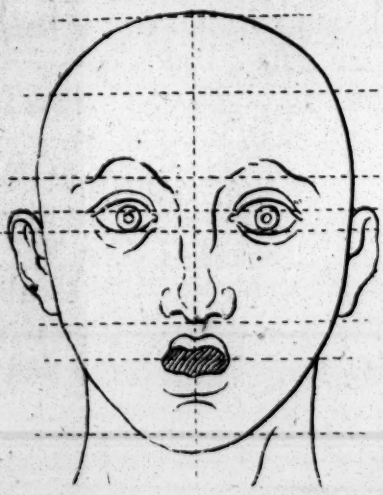
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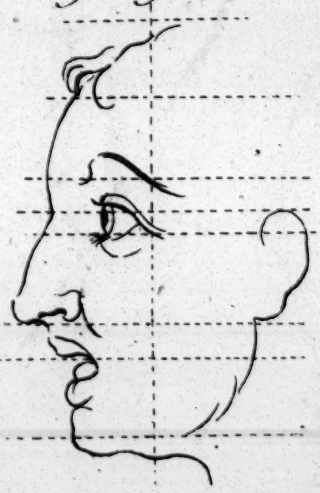
Attention.

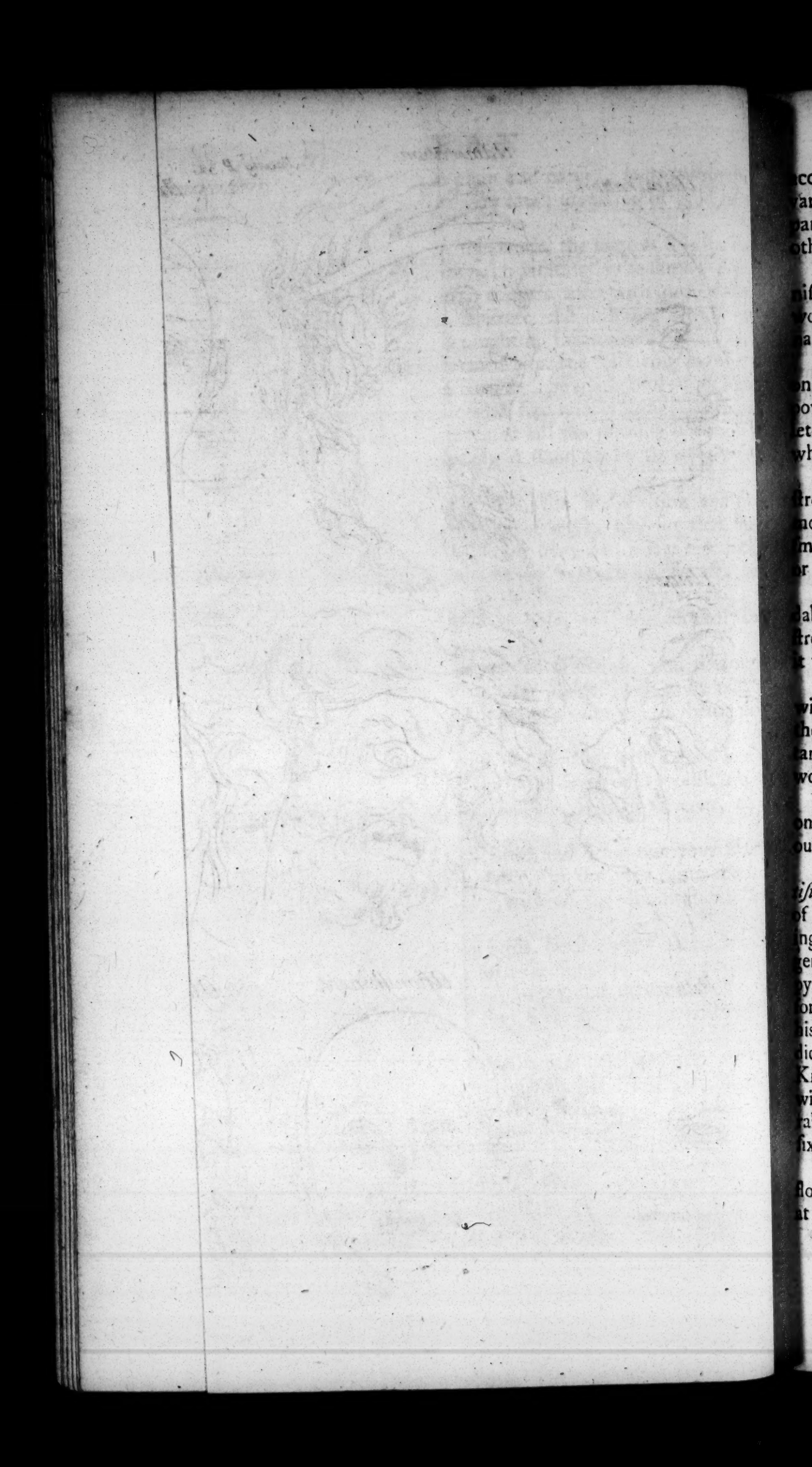


Aſtoniſhment.



Aſtoniſhment.





ccording as the pattern is; taking inſtructions alſo from the ariety of Bantam pieces, which differ vaſtly from thoſe of Japan, in the very manner of the draughts, as well as in their other performance and finiſhing.

The carved work being cut out clean and ſmooth, and finiſhed, and the colours well mixed, lay them into your carved work, with fine and clean pencils, according as reaſon and the nature of the thing ſhall direct.

The colours being laid on and finiſhed, then lay on the gold on thoſe places for which you deſign it; which may be either powder gold or braſs duſt, mixed with gum-water; but rather let it be leaf gold, becauſe it not only looks richeſt, but is that which the Bantam artiſts always uſe.

But the gum-water, it is laid with, muſt be ſomewhat ſtronger; and muſt be laid on with a pencil, and, while it is moiſt, the gold muſt be laid on; being firſt cut with a very ſharp, ſmooth-edged knife into little pieces, either on a leather cuſhion, or on a piece of leather, ſtraitly nailed to a board.

Take up the gold with a little cotton, and with the ſame dab it cloſe upon the work, and then, if your gum-water is ſtrong, it will look rich and beautiful: Otherwiſe, if it be weak, it will appear, as if it were hungry and ſtarved, when it is dry.

When all theſe things have been done, clear up the black with oil, but without touching the colours, leſt you ſhould rub them off or ſully them; for this is not ſecured as the flat Bantam-work is; if any wet ſhould come to them, the colours would ſpoil and come off.

In this caſe it is beſt to leave out the tarniſhing colours, and only uſe ſuch as you may apply the ſecuring varniſh to, without loſs of their ſplendor and beauty.

John BAPTIST GASPARS, commonly called *Lely's Baptiſt*, was born at Antwerp, and was brought up in the ſchool of Thomas Willeborts Boſſaert, a diſciple of Van Dyck; coming over into England, in the time of the civil wars, major-general Lambert took him into his ſervice; and, upon the happy reſtoration of king Charles II, Sir Peter Lely being received for his majeſty's principal painter, he employed Baptiſt to paint his poſtures, which he performed very well; after his death, he did the like for Mr. Riley, and afterwards for Sir Godfrey Kneller. This Baptiſt was a great judge of painting, and likewiſe eminent for his deſigns for tapeſtry, having been an admirable draughtſman in the academy. He died in London about ſixty years ago, and lies buried at St. James's.

John BAPTIST MONNOYER, commonly ſtiled the flower-painter, was born at Liſle in Flanders, and brought up at Antwerp. His buſineſs there was hiſtory-painting; but he

afterwards returned to Liſle, and applied himſelf to flowers, wherein he ſucceeded to admiration. Monſieur le Brun, having undertaken the painting of Verſailles, employed Baptiſt to do the flower part, wherein he ſhewed his excellence, as is yet to be ſeen in that palace.

His grace the duke of Montague, being embaſſador in France, and obſerving the curiouſneſs of this painter's works, invited him over to England, and employed him, in conjunction with Meſſieurs Rouſſeau and La Force, to adorn his magnificent houſe at Bloomſbury, where a great variety of flowers and fruits of this maſter are to be ſeen, and thoſe the beſt of his performances.

There are alſo ſeveral other pieces of his; but the moſt curious of all is the looking-glaſs at Kenſington-houſe, which he painted for the late queen Mary.

He died in England in the thirty-ſixth year of his age, and lies buried in St. James's.

Francis BARLOW, was born in Lincolnſhire, and, at his coming to London, put apprentice to one Shepherd, a face-painter, whom he lived with but few years, becauſe his fancy did not lie that way, his genius leading him wholly to drawing of fowl, fiſh, and beaſts, wherein he arrived to that perfection, that, had his colouring and penciling been as good as his draughts, which are moſt exact, he might eaſily have excelled all thoſe that went before him in that kind of painting. He drew ſome cielings of birds for noblemen and gentlemen in the country.—He alſo drew ſeveral of the monuments in Weſtminſter-abbey, and in Henry VII's chapel, which were intended for a large edition of Mr. Kemp's Monumenta Weſtmonaſterienſia; and died in the year 1702.

Caval. Gio Franceſco BARBIERI *da Cento*, called *Guercino*, born in the year 1590, ſcholar of Benedetto Genuari, lived at Rome and Bologna, excelled in hiſtory; died in 1666, aged ſeventy-ſix years.

Frederico BAROCCI, born in 1528, ſcholar of Battiſta Venetiano; ſtudied Raphael and Correggio; lived at Urbino and Rome; excelled in hiſtory, chiefly religious ſubjects; died in 1612, aged eighty-four years.

Dominico BARRIERA, of Florence, who went commonly by the name of Dominico Florentino, uſed the mark in plate I, N°. 12; but ſome plates he marked with a D. 1647; the ſame mark was uſed by Dominico Bonavera, an engraver of Bologno, and Dominico Bettini, the painter, in his pieces of flowers and animals.

BASHFULNESS, is repreſented by a virgin, clad all in white, with a veil over her face of the ſame colour; holding a lily

lily in her right hand, a tortoise being under her feet. The white vestment denotes her chaste intentions; her veil, to hide her face, intimates, that a virtuous woman ought rather to hide, than to expose her beauty. The lily also represents innocence and Bashfulness; and the tortoise, that a chaste woman should not go much abroad.

BASSO-RELIEVO, } a piece of sculpture, the figures of
BASS-RELIEF, } which do not project far, or stand out from the ground with their full proportion.

M. Felibien distinguishes three kinds of Basso-Relievo's; in the first, the front figures appear almost with their full Relievo; in the second, they stand out but one half; and, in the third, much less, as in coins, vases, &c. See RELIEVO.

B.C. *Equ.* stands for Bartholomew Coriolanus of Bononia, Knt.

Mary BEAL, an English gentlewoman, born in Suffolk, having learnt the rudiments of painting of Sir Peter Lely. She drew after the life, and had great numbers of persons of rank sat to her; especially the greatest part of the dignified clergy of her time, an acquaintance she got by her husband, who was much in favour with that robe. She was little inferior to any of her contemporaries, either for colouring, strength, force, or life, insomuch that Sir Peter was greatly taken with her performances, as he would often acknowledge. She worked with a wonderful body of colours, was exceedingly industrious, and her pictures are much after the Italian manner, which she learnt by having copied after several of the great masters of that country, whose pictures she borrowed out of Sir Peter's collection. She died at her house in Pall-mall, about fifty years ago, being sixty-five years old, and lies buried in St. James's.

BEASTS. For drawing the form of any Beast, begin with your lead or coal, at the forehead, drawing downward the nose, mouth, upper and nether chop, ending your line at the throat.

Then viewing it again where you began, from the forehead over the head, ears, and neck; continuing till you have given the full compass of the buttock, then mark out the legs and feet.

Viewing it again, touch out the breast, with the eminency thereof; lastly, finish the tail, paws, tongue, teeth, beard, and several shadows.

In drawing Beasts, you must be well acquainted with their shape and action; without which you will never perform any thing excellent in that kind: And here, if you draw it in an emblem or the like, you ought to shew the landscape of the country natural to that Beast.

As to the colouring of BEASTS.— 1. Sheep, lay with a thin white, shaded with indigo and soot, and heightened with white.

2. Hogs, lay with brown oker, shaded with soot, and

heightened with maſticot: You may, as you ſee occaſion, colour the hair here and there with ſtronger brown oker; the eyes with vermilion, which you may heighten with maſticot; the mouth with indigo, or white and black, ſhaded with black.

3. A bear, with brown oker, red oker, and black mixed; ſhadow with ſoot alone, or mixed with black, and heighten with brown oker and white.

4. A wolf, with brown oker and ſoot, and ſhadow with more ſoot.

5. A grey wolf, with black, white and brown oker; ſhaded with black and ſoot, or black only; the mouth with black and red oker; ſhaded with black and ſoot, heightened with red oker and white.

6. The elephant, which is of a mouſe grey, with black and white, mixed with ſoot, and ſhaded with black and ſoot, and heightened with the ſame, with a little more white. The noſe, at the end of his trunk, inwardly muſt be laid with vermilion and ceruſs, ſhadowed with black, or black mixed with lake: In the ſame manner, the inner part of the ears; the eyes with white, tending to a grey.

7. Mice, are coloured as the elephant. Rats, a little browner.

8. The unicorn, with a pure white, ſhaded with black; the chaps red, the eye and hoofs with a thin black.

9. The hart, with brown oker, ſhaded on the back with ſoot, which ſweetly drive towards the belly, and ſhade over again with a ſtronger ſoot. The neck and belly with white, the mouth and ears a little reddiſh, the hoof black, the horns with ſoot, and ſhaded with ſoot mixed with black.

10. The hind, with the ſame colours as the hart.

11. The coney, with black and white; the belly all white, ſweetened with black, and heightened with a ſtronger white.

12. The hare, with brown oker; the belly below a little whitiſh; ſhaded on the back with ſoot, and heightened on the belly with white.

13. Apes, monkeys, and the like, with pink and black, heightened with maſticot and white; lay the face with a thin black, mixed with ſoot, ſhaded with black and pink mixed with a little red oker.

14. Cats, of grey and browniſh, or tabby, with indigo, blue and white, heightened with pure white, and ſhaded with Indian blue and black mixed: If of other colours, you may uſe your diſcretion.

15. An aſs, colour with black, mixed with white like grey; if the aſs be of a mingled brown, black and white mixed with brown oker, ſhaded with black in the mouth; heighten with white.

16. The

16. The leopard, with brown oker and red oker, mixed with black, ſhadow it with ſoot; the ſpots with red oker and black, the mouth with black and white, heighten him with light oker.

17. Horſes, oxen, cows, dogs, and ſuch-like, if white, with white, mixed with a little ſoot or oker, ſhaded with a little black and white, and heightened with perfect white.—If of a cheſnut-brown, with red oker and black, ſhaded with black and ſoot, and heightened with red oker and white.—If an aſh-grey, with black mixed with white, ſhaded with black, and heightened with white.—If black, with a thin black, ſhaded with a ſtronger black, and heightened with black and white.—A bay horſe, with vermilion and brown oker; or only with red chalk, ſhaded with red oker, and heightened with red chalk mixed with white.—If ſpotted, by a mixture of the foreſaid colours, and diſcreetly putting every one in his proper place.

Gold-BEATING. Firſt, a quantity of pure gold is melted and formed into an ingot; this, by forging, is reduced to a plate about the thickneſs of a ſheet of paper, and this plate is afterwards cut into little pieces about an inch ſquare, and laid in the firſt and ſmalleſt mould to begin to ſtretch them.

The gold-beaters make gold of divers thickneſſes; but there are ſome ſo fine, that a thouſand of them do not weigh above four or five drachms.

The thickeſt are uſed for gilding on iron and other metals, and the thinneſt for wood. See GILDING.

This gold is beaten on a block of marble, commonly called black marble, of about four feet ſquare, and uſually raiſed three feet high; theſe plates are beaten with three hammers of different ſizes, of well poliſhed iron, ſomething in the form of mallets. The firſt, which weighs three or four pounds, ſerves to chaſe or drive; the ſecond, eleven or twelve pounds, which is to cloſe; and the third, which weighs fourteen or fifteen pounds, to ſtretch and finiſh.

Likewiſe, four ſorts of moulds of different ſizes are uſed. Theſe pieces, of an inch ſquare, are put into the firſt or ſmalleſt mould, which is made of vellum, conſiſting of forty or fifty leaves, and, after they have hammered a while with the ſmalleſt hammer, they cut each of them into four, and put them into the ſecond mould of vellum, which conſiſts of two leaves, to be extended farther.

Then they are taken out again, and cut into four, and put into the third mould, which is made of bullock's gut, well prepared and beaten; then they are taken out and divided into four again, and laid in the laſt and finiſhing mould, which is alſo of bullock's gut, and conſiſts of about five hundred leaves;

and there they are beaten to the degree of thinneſs required.

The leaves, being thus finiſhed, are taken out of the mould, and diſpoſed in little paper books prepared with red bole, to hinder the gold from ſticking; each book uſually contains twenty-five leaves. Theſe books are of two ſizes, twenty-five leaves of the ſmalleſt, of which weigh but five or ſix grains; and twenty-five of the largeſt, nine or ten grains.

BEAUTY. Heavenly Beauty has been repreſented by an exceeding fine woman, naked, ſtanding upright, with her hand reaching the clouds, and encompaſſed with rays, holding in one hand a lily, and in the other a celeſtial globe.

Domenico BECCAFUMI, otherwiſe called Micarino de Siena, born in the year 1484, copied after P. Perugino, and ſtudied after Michael Angelo and Raphael; lived at Rome and Siena, excelled in hiſtory, painting, and ſculpture, and died in the year 1549, aged ſixty-five years.

The BEGINNING, is repreſented by a reſplendent ray in a ſtarry ſky, enlightening the earth adorned with plants, ſurrounding a youth, with a cloud covering his privy members; he holding in one hand the figure of nature, and with the left a ſquare, wherein is the letter A alpha. The ray denotes the power of God being the firſt agent; the ſtars, the power of the planets, the principle of generation; nature, the beginning of motion; the alpha A, the beginning of the Greek vowels, without which no word can be expreſſed.

Giovanni BELLINI, born in 1421, lived at Venice, diſciple of his father Giacomo, excelled in hiſtory, portraiture, and architecture, died in the year 1511, aged ninety years.

Gentile BELLINI, born in the year 1421, diſciple of his father Giacomo, lived at Venice and Conſtantinople, excelled in hiſtory, portraiture, and architecture, died in the year 1501, aged eighty years.

BEN, the Arabian name of a little nut, called, by the Latins, nux unguentaria, and, by the Greeks, balanus myrepſica, from which is drawn an oil of very great uſe in the art of perfuming.

To make the oil of BEN. Blanch the nuts and pound them in a mortar, ſprinkling them with wine; then put them into an earthen or iron pan, and heat them hot; after that put them into a linen cloth, and preſs them with an almond-preſs; repeat this till you have expreſſed all the oil, and then you will have the oil of Ben by expreſſion.

This oil of Ben hath two properties; the one is, that, having no ſcent or odour of itſelf, it neither alters, changes, nor diminiſhes the ſcent of any perfume that is put into it: The other

that it is of a long continuance, ſo that it ſcarcely ever changes, grows rank, corrupts, or putrifies, as other oils do.

To make a perfume of this, put the muſk, amber, &c. in fine powder into it, keep it in a glaſs-bottle very cloſe ſtopped for a month or more, and then uſe it. But, if flowers are uſed, they muſt be gathered about noon, on a dry day, and put immediately into the oil.

BENEFICENCE, is emblematically deſcribed by a damſel of an agreeable pleaſant aſpect; young, becauſe the remembrance and acknowledgment of benefits ſhould never grow old; beautiful, becauſe Beneficence charms every one; naked, to ſhew that it ought to be without intereſt or oſtentation; holding in one hand a bag of gold and variety of jewels, as ready to diſtribute them; and in the other a chain of gold, to ſignify that Beneficence ties and obliges.

Pietro BERETINI *da Cortona*, born in 1596, ſcholar of Baccio Carpi, lived at Rome and Florence, excelled in hiſtory and architecture, died in the year 1669, aged ſeventy-three years.



Cornelius BERGHEM or BERCHEN, uſed this mark.

The BERYL, or aqua marina, when pure and perfect, is a very beautiful gem; but it is at preſent not greatly eſteemed; it is found in various ſhapes and ſizes, but ſeems never to be found ſo very ſmall as many other of the gems: The ſize of a hempſeed is the ſmalleſt commonly met with, and the third of an inch may be eſteemed the common ſize of the larger. It is ſometimes found in form of a ſmall and very irregularly ſhaped pebble, ſomewhat approaching to a rounded or oblong figure, but full of ſmall flat faces irregularly diſpoſed: But its more uſual appearance is in the form of cryſtal, being found in hexangular figures terminated by hexangular pyramids, ſtanding in cluſters on the ſurfaces of rocks, or in the fiſſures of the ſtrata of ſtone. It is ever of a bright and naturally poliſhed ſurface, and is of a mixed colour, of blue and green, making, together, what we call a ſea-water colour. It has this colour, in all degrees, from a very deep and duſky hue to the paleneſs of water; but never has the leaſt tinge of any other colour. The ſtones deſcribed by authors under the names of chryſoberylli, as having a mixture of yellow in their tinge, are, properly, another gem of the praſius kind, they not having the leaſt tinge of blue among the green, or any reſemblance of the ſea-water in colour.

The Beryl, in its fineſt ſtate, approaches to the hardneſs of the garnet; but it is often much ſofter, and conſequently of leſs

value. There is, however, a common error which gives our jewellers an idea of this, and other of our gems, being much ſofter than they really are; which is, the miſtaking the common tinged cryſtals, frequent in mines, and called by authors pſeudoberyllus, &c. for the genuine gems of thoſe names. It is eaſy to conceive thoſe cannot be any harder, and it is natural enough to ſuſpect they cannot be ſo hard as cryſtal in its common colourleſs ſtate.

The Beryl parts with its colour in a very ſmall fire; but is, when colourleſs, greatly inferior to the amethyſt, or ſapphire. It is found in great abundance in the iſland of Ceylon, and in many other parts of the Eaſt-Indies, as alſo in America: Many of them are found alſo in Sileſia, and ſome other parts of Europe; but in this, as in all other gems, the Oriental are vaſtly ſuperior to thoſe of any other part of the world in hardneſs, as well as in luſtre, and the beauty of their colour.

To make a BERYL *colour, or green-blue, viz. a ſea-green for glaſs.* Take cryſtal frit without manganeſe, what quantity you pleaſe; melt it very thin and ſkim off the ſalt, which will ſwim on the top like oil, with an iron ladle, or elſe the colour will be foul and oily: The matter being purified to twenty pounds of it, put, of calcined copper, ſix ounces; zaffer prepared, an ounce and a half; mix them well together: Put this mixture into the pot of metal by little and little, for fear the cryſtal ſhould riſe or ſwell and run over; keep it ſtirring all the while, and then let the metal ſtand and ſettle for three hours, that the colour may incorporate, and then ſtir it again.

Make proof of it, and after the powders have been mixed for twenty-four hours, and having been ſtirred and mixed well, it may be wrought; becauſe the colour is very apt to fall to the bottom.

To make a paſte for a BERYL, *or ſky colour, called aqua marina.* Take rock cryſtal prepared (ſee *Rock* CRYSTAL) ten ounces, minium or red-lead, twenty-five ounces; zaffer prepared, five drachms five grains; reduce them all to a very fine powder, mix them and put them into a crucible able to reſiſt the fire, leaving an inch or more empty; cover it with an earthen cover, lute it well, and dry it; put it into the hotteſt place of a potter's furnace, and let it ſtand as long as their pots; when cold, break the crucible, and you will find a fine ſky colour. Or,

Take rock cryſtal prepared, ten ounces; æs uſtum, one ounce and fifteen grains; mix them, and in a crucible perform the work as the former.

B. F. V. F. ſtands for Baptiſt Francus Venetus fecit.

BICE. Blue Bice bears the beſt body of all bright blues uſed in common work, as houſe-painting, &c. but it is the

aleſt in colour; it works indifferent well, but inclines a little o be ſandy, and therefore requires good grinding, and that on very hard ſtone; it is a blue that lies beſt near the eye of any ow in uſe, except ultramarine; but this laſt is too dear to be ſed in ordinary work.

BIRDS. Begin the draught of them at the head, which be- are of making too big; then bring from under the throat the reaſt-line down to the legs, there ſtay, and begin at the pi- ions to make the wing, which, being joined to the back-line, ill be preſently finiſhed.

The eye, legs, and train muſt be laſt, always obſerving that he fartheſt leg be the ſhorteſt; let their feathers take their be- inning at the head very ſmall, and fall on one way, back- wards, in five ranks, ſmaller and larger to the end.

Method of colouring BIRDS *or Fowls.* 1. The eagle, colour with black and brown oker, ſhadow it with black; heighten he feathers with brown oker mixed with white. Lay the bill nd claws with ſaffron, and ſhade with ſoot and lamp-black; he eyes with vermilion, heightened with maſticot, or with affron, ſhaded or deepened with vermilion, and the talons with lack.

2. The ſwan, with white, mixed with a little black, heighten with fine and pure white, ſo that its plumes or feathers, by that eightening, may look well; the legs with a black colour; he bill, with vermilion, ſhaded with lake; the eye, yellow, with a black round in the middle, from which falls a blackiſh ein, deſcending to the bill.

3. The gooſe, with more white than black, viz. a light grey, heightened with a grey-white; the legs with black; the ill like the ſwan.

4. The duck, with a light grey; the head, with a dark lue, and a dark green neck, ſweetly interwoven; the belly, with white; the legs, with black mixed with a little white, &c. ut be ſure to imitate the life.

5. The turkey, with black mixed with a little white, from he back towards the belly, whiter by degrees, but the belly ſpeckled with black; and in like manner the wings. Shade im with black, and the wings with indigo, ſhaded with ſtronger indigo; the bill with black; the eye blue, heightened with white. To repreſent him angry or provoked, let the naked ſkin of his neck be a blood-red, which lay with vermilion mixed with lake, ſhaded with lake; but, otherwiſe, lay it of a whitiſh-blue colour.

6. The pheaſant, with grey, made of white and black; the feathers of a white-grey; let the whole be ſhaded with black,

and

and heightened with pure white; the eyes, like the falcon; the legs with pink, and ſhaded with black.

7. The falcon, with brown oker, and black mixed with white, and ſhadowed with black, and ſprinkled upon its breaſt; heighten it with white, let his talons be black; above the eyes, lay with ſaffron, and ſhade with vermilion; the bill with grey.

8. The ſtork, with grey, heightened with white, and the corners of his wings with black, his long bill and legs with vermilion, ſhaded with lake.

9. The owl, with ceruſs, black, and ſoot, ſhadowed with ſoot, heightened with yellow oker and white, ſometimes white alone; the eyes yellow, circled with white; the legs of a brown-yellow.

BISTER or BISTRE, a colour made of chimney-ſoot boiled, and afterwards diluted with water, ſerving painters to waſh their deſigns. Inſtead of this, ſome uſe the ſtrokes of a pen, ſome Indian ink, others a black ſtone, &c.

BLACK, the proper Black for painting in water-colours, is ivory Black, which, if it be pure and well ground, is of uſe in painting in miniature, but is not proper for colouring prints; for it is too heavy a colour, and hides the beautiful ſtrokes of the graver, unleſs done with great care; and, therefore, a ſtronger tincture of good Indian ink is more proper than the ivory Black; but, to colour pieces in miniature, uſe the ivory Black prepared as follows:

Grind the ivory Black very well in gum water, then beat the white of an egg very well, till you perceive a kind of oily liquor ſettle to the bottom; this liquor mix with as much of the ivory Black as you think will be proper to permit it to run freely in the pencil, and it will bear an extraordinary gloſs; and if the object is ſhining, ſuch as the wings of ſome beetles, mix, with ſome of it, a little white upon a glazed Dutch tile, till you find it light enough to relieve the ſhade, and then make another lighter mixture of the ſame; which, being uſed on the brighter part of the ſubject, will produce the effect you deſire.

Note, You muſt never put any Black among your colours to make them dark, for it will make them dirty; neither ſhould you ſhadow any colour with Black, unleſs it be Spaniſh brown, when you would colour an old man's gown, that requires to be done of a ſad colour, for whatever is ſhadowed with Black will look dirty; and not bright, fair, and beautiful.

Ivory BLACK, is made of ivory burnt, generally between two crucibles well luted: Which, being thus rendered perfectly Black, and in ſcales, is ground in water, and made into troches, or little cakes, uſed by the painters, as alſo by the jewellers, to blacken the bottom or ground of their collets; wherein

wherein they ſet their diamonds, to give them their teint or colour.

Lamp or *Smoke* BLACK, is the ſmoke of roſin, prepared by melting and purifying the roſin in iron veſſels, then ſetting fire to it under a chimney or other place made for the purpoſe, and lined at the top with ſheep-ſkins, or thick linen cloth, to receive the vapour or ſmoke, which is the Black; in this manner they prepare vaſt quantities of it at Paris.

This Black may alſo be made by the burning of Lamps, having many wicks, covered with a very large top at a due diſtance, to receive the ſmoke, which, continually ſticking upon the top, produces this Black colour; the top of this lamp may be taken off every half-hour, and the Black ſwept off it; then the wicks being ſnuffed, and the cover or top being put on again, repeat this till you have what quantity of colour you deſire, or till all the oil is burnt out; this Black is of excellent uſe for Black varniſh. A quart of oil, worth about ſix or eight pence, will make Black enough to do a large cabinet.

In England it is uſually prepared from the reſinous parts of woods, burnt under a kind of tent, which receives it; it is uſed on various occaſions, particularly in printers ink; for which it is mixed with oils of turpentine and linſeed, all boiled together.

German or *Frankfort* BLACK, is made of the lees of wine, ivory, or peach-ſtones burnt, then waſhed in water, and ground in mills for that purpoſe.—This Black makes the principal ingredient in the rolling-preſs printers ink. It is moſt generally brought from Frankfort, Mentz, or Straſburg, either in lumps or powder.—That which is made in France, is not in general ſo well eſteemed as that made in Germany, by reaſon of the difference of the lees of wine uſed in the one and the other.

To make a BLACK *from ſheeps feet.* Take ſheeps bones, calcine them in an oven, or in a crucible in a furnace, and quench them in a wet cloth; they muſt be ground in water before any gum is put to them.—This Black will mix with lake and umber for carnation, in miniature or water-painting.

To dye wood, horns, and bones, BLACK. Diſſolve vitriol in vinegar or ſpirit of wine, and infuſe them in it. Or,

Take litharge and quick-lime of earth, two pounds; mix them with a ſufficient quantity of water, and put in the bones, and ſtir with a ſtick till they boil a-pace; then take it off the fire, and ſtir till it is cold, and the bones will be very Black.

Spaniſh BLACK is ſo called, becauſe firſt invented by the Spaniards; and moſt of it brought from them, is no other than burnt cork, uſed in various works, particularly among painters.

Earth BLACK, is a kind of coal found in the ground, which, being well pounded, is uſed by painters in freſco.

BLACK, *for painting or ſtaining glaſs.* Take ſcales of iron from the ſmith's anvil, grind them for three hours on a ſhallow copper or braſs plate, ſuch as ſpectacle-makers uſe to grind their glaſſes upon; take of this powder and of rocaille, of each what quantity you pleaſe; add to them a little calcined copper, to hinder the iron from turning red in the fire; grind all to an impalpable powder, and keep it in a glaſs cloſe ſtopped for uſe.

A velvet BLACK, *for glaſs.* Take ten pounds of cryſtal frit in powder; of calx of lead and tin, each one pound; mix them well together, and put them into a pot, heated in the furnace; and, when this glaſs is melted and purified, throw in an ounce and a half of ſteel calcined and powdered, and one ounce and an half of the ſcales of iron from the ſmith's forge powdered; mix the whole well as you caſt them in, that the glaſs may not riſe, but incorporate more intimately with the ingredients. Let all continue twelve hours; during which time, ſtir them ſometimes; after which you may work it, and you will have a very fair velvet Black colour.

Another velvet BLACK, *fairer than the foregoing.* Take twenty-five pounds of Rochetta frit, half a pound of tartar, an ounce and an half of manganeſe prepared; reduce all to a powder, and mix them well together; put them into a pot, which ſet into the furnace leiſurely, that the matter do not riſe too much. Let it melt and purify during the ſpace of four days, or thereabouts; mix the materials well, caſt them into the water, the better to purify, and then melt them again; and you will have a Black of an extraordinary beauty.

Dyers BLACK, is one of the five ſimple and mother colours uſed in dying. It is differently made according to the different quality and value of the ſtuffs to be dyed.

For broad-cloths, fine ratines, druggets, &c. they uſe paſtel, or woad, and indigo; the goodneſs of the colour conſiſts in there not being above ſix pounds of indigo to a ball of paſtel, when the paſtel begins to caſt its blue flower, and in its not being heated for uſe above twice.

The ſtuff being blued, it is boiled with allum or tartar, then maddered, and, laſtly, the Black given with galls, copperas, and ſumach; to bind it and prevent its ſmearing in uſe, the ſtuffs are well ſcowered in the fulling-mill, when white, and then well waſhed afterwards.

For ſtuffs of leſs value, it is ſufficient, that they be well blued with paſtel, and blackened with galls and copperas. But no ſtuff can be regularly dyed from white into Black, without paſſing through the intermediate blue.

Yet there is a colour called cold Black, or jeſuits Black, prepared of the ſame ingredients as the former, but without being

rſt dyed blue. In this caſe the drugs are diſſolved in water, hat had boiled four hours, and ſtood to cool till the hand can bear it; then the ſtuff is dipped in again and again, and taken out ſix or eight times.

Some prefer this Black to the other, but on weak grounds; this method of dying Black is ſaid to have been invented by the Jeſuits, and to be ſtill practiſed in their houſes.

To dye BLACK. Take ſix handfuls of alder-bark, or alder-ops, more or leſs, made ſmall; put them into a copper with ſufficient quantity of water, and boil them for an hour with a very good fire; then take them out, and put in two pounds of nut-galls bruiſed ſmall, one pound of ſumach, and four ounces of log-wood, and boil them; then enter twenty yards of cloth and handle it, and boil it for four hours; then take it out and cool it, and put in a pound of copperas; which, when it is melted, enter the cloth again, and handle it; then boil it an hour, and cool it again; then put in two gallons of chamber-ley, and enter the cloth again, and let it boil for half an hour more; then take it out, cool it, and waſh it well.

To dye a BLACK *upon blue.* Take about nine or ten gallons of water, as many ounces of nut-galls beaten: Wool, woollen, yarn, or woollen cloth or flannel, to the weight of about three pounds: Let them be boiled for four hours; after which, take the matter out and air it; then put into the liquor eighteen ounces of green copperas; and, if there be not liquor enough left, put in more water, as much as will cover the ſtuff, &c. and boil it for two hours, handling it continually.—Then take it out and air it, then put it in again, and take it out again and air it, and put it in again till it is Black enough; after this cool and waſh it.— But take notice, if you put in ſome ſumach with the galls, it will make a better Black.

Another BLACK *dye.* Take fair water, a ſufficient quantity; of nut-galls bruiſed, a pound; of ſumach, half a pound; of alder-bark and oak-bark, of each a quarter of a pound; make them boil, which, when the water, &c. begins ſo to do, put in a little cold water, to break the boiling; ſtir all well together, and enter your cloth, letting it boil for three hours; after this take it out, and put in more freſh water, and make it boil again, adding to it a pound of copperas, which, when it is diſſolved, put in your cloth again, and boil it two hours; then take it out again, and put in ſome more copperas, and half a pound of ground logwood; make it boil and put in the cloth again, and let it boil an hour.

This quantity of drugs will dye five yards of broad-cloth, or ten yards of cloth three quarters wide.

Another BLACK *Dye.* Take water, a ſufficient quantity; log-

wood

wood ground, ſumach, of each a pound; of nut-galls bruiſed ſmall, two pounds; boil them together for an hour, then enter the cloth, wool, yarn, &c. and, when they have boiled an hour, take them out, cool and air them; then put in three pounds of copperas, let it melt, and then put in the cloth, wool, &c. again, and let it boil near an hour, then take it out and waſh it.

Theſe quantities of drugs will dye twenty pounds weight of any of the former things.

Another BLACK, *for twenty yards of broad-cloth.* Take water, a ſufficient quantity; of nut-galls bruiſed ſmall, two pounds; of alder-bark, a pound and an half; mix all together in the copper, and ſet it a boiling; and, when it does ſo, put in the cloth, letting it boil for three hours; then take it out and let it cool; then put in half a pound of copperas, and, when it boils, put in your cloth again, and boil it for an hour more; handle it and boil it for an hour, then take it out and cool it; after which, put in more copperas, and ſome urine; then put the cloth in again, and boil it till it is Black enough.

To make a firm BLACK *Dye.* Firſt wad it with the blue (ſee *Dying* BLUE) then take water, thirty quarts; one pound of galls bruiſed ſmall; and of vitriol three pounds; firſt boil the galls and water with the ſtuff or cloth for two hours; then put in the copperas as a cooler; heat for one hour, after which take out the cloth or ſtuff, and cool it and put it in, boiling it for another hour; laſtly, take it out again, cool it, and put it in once more.

To recover the colour of BLACK *cloth, when decayed.* Boil the leaves of fig-trees well in water, waſh the cloth in it, dry it in the ſun, and it will be a much fairer Black.

To dye martins ſkins with long hair of a very good BLACK, *which never fades.* Take a ſufficient quantity of water, two pounds of new nut-galls, and two ounces of beef marrow; boil them in an earthen pot cloſe covered, ſtirring often, leſt the galls burn and boil, till it makes no noiſe when you ſtir it; then beat it, and ſtrain out:

Take, of this liquor, two pounds; copperas, twelve ounces; roche allum, twelve ounces; litharge, eight ounces; verdigreaſe, ſumach, and ſal-armoniac, of each four ounces; pound each of them ſmall, diſtinct by itſelf; then mix and boil them together, and keep the liquor to dye with.

But remember, before you apply the liquor, the ſkins muſt be waſhed two or three times in very pure clear lime-water; and, when you apply the dye, you muſt do it with a pencil, againſt the grains of the hair, and, afterwards, the other way too.

Theſe ſkins, when dry, differ little or nothing from ſables. Some leave the verdigreaſe out, but it does no hurt to the liquor.

To

To dye the Hamburgh BLACK. It is to be ſuppoſed, that the ſtuffs have been firſt blued with woad or indigo, in a manner that is laſting —Take twelve ounces of tartar, one pound of vitriol, boil the ſtuffs in it for two hours, then rinſe it clean and dry it.

Blue it as follows: If your dye be either woad or indigo, then you muſt give the ſtuffs a deep ground, which will give them a brighter luſter. For the ſecond blue, boil woad and brown wood, and blue the ſtuff to the depth of indigo, or to a ſort of iron-grey, after which, it will be eaſy to dye it Black; but the nicety lies in the bluing. After the bluing, the ſtuff muſt be rinſed clean, and dried again. Then follows

The galling. Take ſix ounces of galls, two ounces of madder, a quarter of an ounce of calcined tartar, and therewith gall the ſtuff for the ſpace of an hour, not rinſed, but dried; and then galled a ſecond time, the ſuds being a little ſtrengthened in the following manner:

Add half an ounce of galls to the remaining ſuds, and half an ounce of madder, one ounce of calcined vitriol, one ounce, not yet, of gum Arabic; when you have done this, before the ſtuff is rinſed or dried, it muſt be blackened in the gall liquor as follows: Boil the liquor, then take one pound of vitriol, firſt diſſolved in ſpring-water, which muſt be poured into the dye; then add to the alder-black half an ounce of galls, one ounce of madder, one ounce of white gum, one drachm of maſtich; and, after the ſtuff has been dyed black in the dye, rinſe it out clean and dry it, now, as well as after the ſecond blacking, which is to be done in the following manner:

Take half a pound of vitriol, and, immediately afterwards, half an ounce of galls, one drachm of maſtich, half an ounce of gum tragacanth, and both times let the ſtuff be an hour a blackening, till it hath got a laſting dye.

To dye green thread BLACK. Take a proper quantity of ſharp ley, and put into it three quarters of a pound of Braſil wood, boil them together, and afterwards pour the liquor into a vat, and add gum Arabic, alum, and verdigreaſe, of each one ounce; then put in the green thread, let it lie for the ſpace of one whole night, and it will become Black.

To dye ſilk BLACK. Pour three pails of water into a copper, and add two pounds of beaten galls, two pounds of ſumach, and two ounces of madder, four ounces of antimony reduced to an impalpable powder, two of ox-gall, one ounce of gum tragacanth; let them diſſolve a proper time, and then put in a proper quantity of dry alder-bark powdered, two pounds of vitriol, and twelve ounces of filings of iron; then pour off the water, and let them boil together two hours; after which, fill it up with

with half a pail full of barley, or rather malt water, which is drawn off by brewers; after boiling again half an hour, put in the ſilk; let it boil gently for half an hour, then take it out and rinſe it in a copper full of water, and throw it again into the dye; and, afterwards, when you take it out, rinſe it very clean in river water; hang it up in the air to dry, then put it into the dye again, and boil it gently for half an hour, rinſe it in the copper as before, and afterwards in river water, and, when it is dry, take good ley, and add to it the eighth part of a pound of good pot-aſhes; rinſe the ſilk very well in this liquor, and, laſtly, in river water, then dry it, &c.

An additional improvement to the former dye. Having dyed ſilks Black, as above, take ſal-armoniac and antimony powdered, two ounces; filings of iron, two handfuls; put them together in a copper, that has been drawn off, and hath been uſed before; make it ſo hot that you can bear your hand in it, that this additional dye may the better penetrate.

Then take the Black ſilk, having been well dried, and put it into the copper; let it lie there for an hour, till it is thoroughly moiſtened; then draw it through water, in which a proper quantity of gum tragacanth has been diſſolved, taking care that it be thoroughly wetted; then dry it as uſual.

To give a luſtre to BLACK *ſilks.* After the Silk has been dyed, for every pound of it take an ounce of iſing-glaſs, which ſteep in water, and paſs the ſilk through the liquor, and it will be of a very beautiful luſtre.

To dye ſilk of a very fine BLACK. Into a copper, holding a tun of water, put three quarters of a ſack of bark, three pounds of Provence wood, and three pounds of ſumach; boil them for two hours, ſtrain them into a fat, throw away the dregs, and fill up the copper again; and then add ſeven pounds and a half of beaten galls, half a pound of agaric, a pound and an half of pomegranate-ſhells, a pound of calamus, a pound and an half of ſenna leaves, a pound of gentian, and the ſame quantity of wild marjoram; boil all theſe together for two hours, ſtrain the liquor through a ſieve into the other dye, and let it digeſt for four days, ſtirring it often, and then put it into the copper, in which you intend to dye; make a fire under it, and, when it is hot, put in a pail-full of ley, and boil all together very well; and, when this is done, add half a pound of antimony, two pounds of honey, a quarter of a pound of borax, half a pound of litharge of ſilver, and a quarter of a pound of litharge of gold, and half a pound of verdigreaſe; beat theſe together and put them into the kettle, and, when the dye is warm, throw in fifteen pounds of lockſmith's filings, ten pounds of gum, and ten pounds of copperas, and let theſe ingredients ſtand to ſettle

eight

ight days, ſtirring it, as occaſion requires; and after this you ay dye with it, firſt putting in a pint of brandy.

A receipt to make a dye good. When it ſhall happen that the ye begins to work off, you ought to conſider what time of the onth it was made, and what time worked; then put three ailfuls of water into a kettle, and add to it two ounces of bo-ax, half a pound of agaric, and a quarter of a pound of li-harge of ſilver; four ounces of madder, half a pint of brandy, nd a quarter of a pound of verdigreaſe; boil theſe all together or an hour, and then put them into the dye, and let it ſtand o ſettle for a fortnight, ſtirring it often.—Then make a liquor f two pounds of ſenna leaves, two pounds of gentian, one ound of agaric, and two pounds of pomegranate ſhells; boil them ogether for two hours, and then pour them into the dye; when his has been done, the longer you dye with it, the finer Black olour will be produced; but particular care muſt be taken hat no ſoot get into it, for that will ſpoil it paſt all help.

But, if any greaſe or tallow happens to fall into the dye, let it cool and take it clean out, and, if you cannot ſee it, make he ladle red-hot and ſtir the dye about, and that will conſume or burn up any greaſineſs; alſo fill two or three canvas bags ith bran, and hang them in the dye while it is hot, and let it continue two or three hours; then take out the bags, and over the dye with brown paper; and that will attract all the reaſineſs of it.

But when the dye begins to decay, whenever you dye, you uſt ſtrengthen and refreſh it in the morning with ſix pounds gum, ſix pounds of copperas, four pounds of filings, and a arter of a pail of ley; then dye with it, three days, ſix pounds ſilk at a time.

When the ſilk is dyed, it muſt be boiled, and galled as fol-ows:—To every pound of ſilk take twelve ounces of galls, nd boil them two hours; then wring the ſilk, and lay it in he liquor for two nights and a day.

A BLACK *Dye for re-dying hats or any thing that has loſt its lack colour.* Take half a pound of blue Provence wood, boil in a pint of ſtrong beer, till half of it be conſumed; then add lf a pound of vitriol, and an ounce of verdigreaſe; take t the wood, and put in a quarter of an ounce of gum traga-nth; let it ſtand, and, when you have occaſion to uſe it, dip little bruſh in it, and ſo ſtreak it over the hat, wool, or ſilk, d it will give a fine laſting Black.

BLACKNESS, is the quality of a Black body, or a colour ariſing from ſuch a texture and ſituation of the ſuperficial parts the body, as does as it were deaden or rather abſorb the light lling on it, without reflecting any or very little of it to the eye.

Sir Iſaac Newton has ſhewn in his Optics, that, for the production of Black colours, the corpuſcles muſt be leſs than thoſe which compoſe any other colours; becauſe, where the ſizes of the component particles are greater, there is too much light reflected to conſtitute this colour; but if there be a little leſs than is requiſite to reflect the white, and the very faint blue of the firſt order, they will reflect ſo little light, as to appear intenſely Black; and yet may, perhaps, reflect it variouſly to and fro within them ſo long, till it happen to be ſtifled and loſt; by which means they will appear Black, in all poſitions of the eye, without any tranſparency. See LIGHT and COLOURS.

BLANCHING, in coining, is the preparation that is given the pieces before they are ſtruck, to give them the luſtre and brilliancy. It is performed by heating the pieces on a kind of peel with a wood fire, in the manner of a reverberatory; ſo that the flame paſſes over the peel.—The pieces, having been ſufficiently heated and cooled again, are put ſucceſſively to boil on two other peels of copper, in which are aqua-fortis, common ſalt, and tartar of Montpelier; after they have been well drained of this firſt water in a copper ſieve, ſand and freſh water is thrown over them, and, when they are dry, they are well rubbed.

BLEACHING, is the art or method of whitening linens, ſtuffs, ſilks, &c. and is as follows:

For BLEACHING *fine linens.* When they come from the loom, and while they are yet raw, they are to be ſteeped a day in clear water, waſhed out and cleared of their filth, and then thrown in the bucking-tub, filled with a cold lixivium or ley. When theſe are taken out of the ley, they are to be waſhed in fair water, then ſpread in a meadow, frequently watered from little dikes, or canals interſperſed in the ground, by means of ſcoops, or a ſort of long hollow ſhovels, called by the Dutch, who invented them, gieter.

After the linen has lain a ſufficient time on the ground, and every thing has been repeated as before, it is to be paſſed thro' a new ley poured on hot, and again waſhed in clear water, and laid a ſecond time on the ground; and then paſſed through a ſoft gentle ley, to diſpoſe it to reſume the ſoftneſs which the other ſharper leys had taken from it; then waſhed in clear water, ſoaped with black ſoap, and that ſoap is to be waſhed out again in clear water; then it is to be ſteeped in cows milk, the cream having been firſt ſkimmed off, which finiſhes the whitening and ſcowering, gives it a ſoftneſs, and makes it catch a little nap; when it is taken out of the mill, it is waſhed in clear water for the laſt time.

After all this proceſs, they give the linen its firſt blue by paſ-

ſing

ing it through a water, wherein a little ſtarch, pale ſmalt, and Dutch lapis have been ſteeped.

In the laſt place, the proper ſtiffneſs and luſtre is given with ſtarch, pale ſmalt, and gum tragacanth; the quantity and quality of which may be adjuſted according to occaſion.

The whole proceſs of Bleaching is finiſhed in fine weather, in a month's time; in bad weather, it takes up ſix weeks or more.

To BLEACH *coarſe linens.* They are taken from the loom, and laid in wooden frames, full of cold water, where they are ſo beaten by wooden hammers, worked by a water-mill, as to be inſenſibly waſhed and purged from their filth; then they are ſpread upon the ground, in order to receive the dew for eight days, which will take off more of the rawneſs: After which they are put into a kind of wooden tubs or pans, with hot ley poured over them.

Having been thus lixiviated, they are again purged in the mill, then laid on the ground again for eight days more, and paſſed through a ſecond ley; and all things repeated, till they have acquired their intended degree of whiteneſs.

BLEACHING *woollen ſtuffs.* There are three methods of whitening woollen ſtuffs; the firſt is with water and ſoap, the ſecond with vapour of ſulphur, and the third with chalk, indigo, and vapour of ſulphur.

For the firſt, when the ſtuffs are come from the fulling-mill, they are put into ſoaped water, pretty hot, and worked a-freſh by force of arms over a bench, whereby the whitening, which the fulling-mill had begun, is finiſhed; in the laſt place, they are waſhed out in fair water and dried; this is called the natural way of Bleaching.

The ſecond method is what is commonly called Bleaching by the flower, and is thus performed: The ſtuff is firſt waſhed in river water, and then put to dry on poles; when it is half dry, ſpread out in a kind of ſtove, wherein ſulphur is burnt, the vapour of which, diffuſing itſelf, covers by little and little the whole ſurface of the ſtuffs, and gives it a fine whitening.

The third motion is thus: After the ſtuffs have been waſhed, they are to be thrown into cold water, impregnated with chalk and indigo, in which they are well agitated; they are waſhed a-freſh in elder water, half dried on poles, and then ſpread in a ſtove to receive the vapour of the ſulphur, which finiſhes the bleaching. Though this method of Bleaching is agreeable enough to the ſight, yet it is not eſteemed the beſt; for it muſt be remembered, that, when a ſtuff has once received the ſteam of ſulphur, it will ſcarce receive any beautiful dye, except black and blue.

BLEACHING *of ſilk.* The ſilk, being yet raw, is put into

a linen bag, and thrown into a veſſel of boiling river water, in which ſoap has been diſſolved, and thus boiled for two or three hours; the bag being turned ſeveral times, taken out and beaten, waſhed out in cold water, wrung out ſlightly, and thrown into a veſſel of cold water, mixed with ſoap and a little indigo, which gives it the bluiſh caſt that is obſervable in white ſilks.

When taken out of the ſecond veſſel, it is wrung out, and all the water and ſoap preſſed from it; after which it is ſhook out to untwiſt and ſeparate the threads, and hung up in the air in a kind of ſtove made on purpoſe, in which ſulphur is burnt; the vapour of which gives the laſt degree of whiteneſs to the ſilk.

BLEACHING *Hair*, is done by ſpreading the hair to be bleached upon the graſs, after the ſame manner as linen, after it has been firſt waſhed out in a lixivious water, which, together with the force of the ſun and air, brings the hair to ſo perfect a whiteneſs, that the moſt experienced perſon may be deceived therein; there being ſcarce any way of detecting the artifice, but by boiling and drying it; which leaves the hair of the colour of a dead walnut-tree leaf.—There is alſo a method of dying hair with biſmuth, which renders white hair, bordering too much upon the yellow, of a bright ſilver colour. This alſo may be proved by boiling; the biſmuth not being able to ſtand it.

BLINDNESS *of mind*, is repreſented, in painting, by a lady cloathed in green, ſtanding in a meadow full of various flowers, her head inclined, and a mole by her ſide.—The mole is an emblem of Blindneſs: Her head being inclined towards flowers, ſignifies worldly delights, which allure and buſy the mind to no purpoſe; for, whatever the flattering world promiſes, yet all is but a clod of earth, veiled under the falſe hopes of pleaſures; but attended with real dangers all our days.

MB *Michael Le* BLON, of Franckfort, uſes this mark; he died in Amſterdam, in the year 1650.

To dye a BLOOD *Colour*. Firſt tinge the ſtuff yellow, with a quartern and a half of madder to a pound of woollen ſtuffs; alum them and work them till they are of as beautiful a colour, as you would have them; then rinſe them well out, and put into the kettle a tub of ſtale urine, and boil it again, till they take the dye; then roll the ſtuffs three or four times thro' it, and rinſe them very clean.

To dye ſilk a BLOOD *Colour*. Soak the ſilk as before directed, and for each pound of it take half a pound of alum, and a quarter of a pound of tartar; beat them ſmall, and boil them in the quantity of a pailful of prepared liquor for a quarter of an hour; then put in the ſilk, and let it ſteep for two hours; then

then take it out, rinſe it and beat it on a block, and hang it up to dry.

Then put four ounces of galls powdered into the quantity of a pail of water, ſet it on the fire, till it is juſt ſo warm as you can bear your hand in it; then put in the ſilk, and let it lie for two hours; then take it out and dry it.

This being done, put a pound and half of braſil in a linen bag, and put in with it ſome good wheaten bran water into a kettle, boil them together, being cloſe covered; then take the kettle off the fire, and let it ſtand a whole night; then add a quarter of an ounce of pot-aſhes, and boil it again for an hour; then pour on as much river water, as the liquor.

Then take out the bag of braſil, and put in the ſilk after it has been a little ſcummed; cover the chaldron very cloſe, and let it remain there half an hour; then wring it out and rinſe it very clean in river water; wring it out again, and hang it out again, and let it dry; and, if it be not enough dyed, boil the dye again, and put in the ſilk once more and clean it with ſoap, as in the crimſon dye, and afterwards rinſe it in the river water, and you will have a beautiful red.

BLUE, is one of the primitive colours, otherwiſe called azure.

Painters BLUE is made differently, according to the different kinds of painting.

In limning, freſco, and miniature, they uſe indifferently ultramarine, Blue aſhes, and ſmalt; theſe are their natural Blues, excepting the laſt, which is partly natural, and partly artificial.

In oil and miniature they alſo uſe indigo prepared and ultramarine.

Enamellers and painters upon glaſs have Blues proper to themſelves, each preparing them after their own manner.

Turnſole BLUE is a Blue uſed in painting, made of the ſeed of that plant. The way of preparing it is to boil four ounces of turnſole in a pint and half of water, in which lime has been ſlacked.

To dye ſkins BLUE. Boil elder-berries or dwarf-elder, then ſmear, and waſh the ſkins therewith, and wring them out; then boil the berries as before in a diſſolution of alum water, and wet the ſkins in the ſame manner once or twice, dry them, and they will be very Blue.

Another way to dye ſkins BLUE. Steep the beſt indigo in urine for a day, then boil it with alum, and it will be good; or temper the indigo with red wine, and waſh the ſkins therewith.

The Pruſſian BLUE. This Blue is next to ultramarine for beauty, if it be uſed in oil; though I am not certain whether

it will hold as well as the other, conſidering it has not the body of ultramarine.

This colour does not grind well in water; becauſe there is ſuch an oily quality in it, that it does not mix kindly with water, and at the beſt will change, as it is now prepared in the common way.

Attempts have been made to make of it a Blue ink; which indeed has held the colour for a month or two, but then turned to a muddy yellow.

And, when you put your pencil with gum water into a ſhell of this Blue, you will find, where the water ſpreads, the Blue will change yellowiſh, till the body of the Blue is well ſtirred up.

And, after all that can be done with this colour in water, it will only ſerve to ſhade ultramarine with; but in oil it will ſerve very well for the preſent to ſupply the place of ultramarine.

BLUE *Bice* is a colour of a good brightneſs next to Pruſſian Blue, and alſo a colour of a body, and will flow pretty well in the pencil; eſpecially if it be well waſhed, as it is directed to be done of the whites and minium.

Saunders BLUE is alſo of very good uſe, and may ſerve as a ſhade to ultramarine, or the Blue bice, where the ſhades are not required to be very deep; and is of itſelf a pleaſant Blue, to be laid between the lights and ſhades of ſuch a flower as is of a mazarine Blue.

A fine BLUE *from Mr. Boyle.* Take the Blue leaves of rue, and beat them a little in a ſtone mortar, with a wooden peſtle; then put them in water, juice and all, for fourteen days or more, waſhing them every day till they are rotten; and at laſt beat them and the water together, till they become a pulp, and let them dry in the ſun.

This will produce as good a Blue as indigo, and be much ſofter; but, in order to keep it a long time, when you beat it the laſt time, add to it a little powder of gum Arabic; of which you may put more or leſs, as you would have it more free or tenacious in the working. It is a fine Blue for ſhading, has a good body, and runs warm in the pencil.

Indigo BLUE. This makes the ſtrongeſt ſhade for Blues of any other, and is a ſoft warm colour, when it has been well ground and waſhed, with gum water, by means of a ſtone and muller. It is made of what lightneſs you pleaſe, by putting more gum water to it; and, by how much there is leſs, the darker it will be.—Before you uſe it upon a print, it will be proper to try it upon a Dutch tile, for it runs warmly in the pencil, and ſo perhaps may otherwiſe prove too ſtrong for your deſign, which is always to be taken care of, when a flowing colour is to be laid over a dark ſhade of a print; which ſhade will

ill much heighten its blackneſs, and even make it appear uite black.

Lacmus or Litmus BLUE. This is a beautiful Blue, and will un in a pen as free as ink. It is made of lacmus, or as ſome all it litmus, which may be had at the druggiſts.—But, as this olour is never to be met with prepared, I ſhall here ſet down e method of preparing it:

Take an ounce of lacmus, and boil it in about a pint of mall beer wort, till the colour is as ſtrong as you would have ; then pour off the liquor into a gallipot, and let it cool for ſe; it will ſoon become a jelly, and by degrees grow hard.

But this colour is to be opened again, and made liquid by ater, ſo as to be uſed as ink; and will be either paler or darker, s it is made thicker or thinner. This affords a bright colour, nd has extraordinary effects; for it is not only a beautiful, but holding colour.

It is a good ſhade for ultramarine, or Blue bice, where the trongeſt ſhades ſhould not be extremely deep; and for colouring of prints it is very good, as it is a tranſparent colour, and oes a great way.

A tranſparent BLUE *from Mr. Boyle equal to ultramarine.* This is a beautiful Blue, and the chief ingredient of which it s made, is the cyanus or Blue cornbottle-flower, which abounds lmoſt in every corn-field, and may eaſily be had, during four of the ſummer months; and may be gathered by children about he ſkirts or verges of corn-fields, without doing any damage o the corn. This flower has two Blues in it, one of a pale colour in the larger outward leaves, and the other of a deeper Blue that lies in the middle of the flower.

Both theſe will do, being ſeparated from the buttons or caſes, in which they grow; but the deep Blue leaves in the middle produce by much the beſt colour; which may be obſerved by rubbing the leaves, while they are freſh, ſo hard upon a piece of good writing-paper, as to preſs out the juice, and it will yield an excellent colour, which will not fade, as has been found by the experience of two or three years. This part of the flower is therefore the principal, and what may be depended upon; which ſhould be picked from the reſt of the flower-leaves, the ſame day, if it may be, or the next, or as ſoon as poſſibly can be.

A good quantity of theſe middle leaves being procured, preſs out what juice you can from them, and add to it a little alum, and you will have a laſting, tranſparent Blue, of as bright a ſtaining colour as can be deſired, ſcarce inferior in beauty to ultramarine, and as durable. As for the outward flower-leaves which are paler, it is not certain that they will anſwer the

end; but, upon ſome trials being made, that may alſo be known.

Let the flowers be gathered about the beginning of June, or in July or Auguſt, and ſome may be found in May; but the preparation of the colour by picking out the middle deep Blue flower-leaves, and preſſing out the juice, muſt be preſſed out with all the expedition poſſible, or they will loſe their perfections.

It is very probable, that, if the chives of theſe Blue cornbottle-flowers were cured in the ſame manner as ſaffron is, they would produce a much greater body of colour, from which a tincture might be drawn with more eaſe, than if preſſed raw or freſh from the field. In order to do this, ſuch a kiln ſhould be prepared as is uſed for curing ſaffron, in which may be made a ſmall charcoal-fire, which will communicate an heat to the top of the kiln, which is to be covered with an hair-cloth; upon which ſhould be laid four or five ſheets of white paper, ſuch as is uſed in curing of ſaffron; then a parcel of picked flowers are to be laid on to the thickneſs of two or three inches, laying cloſe and flat with a knife, and ſprinkling with ſome thin gum water; then the cake of flowers is to be covered with two or three more ſheets of paper, and a board with a ſmall weight laid on for a few minutes; after which the board is to be taken off, and the cake of flowers to be turned upon the kiln, taking hold of all the papers with both hands; and, when it has been rightly placed, take off the upper papers, and ſprinkle the cake again with ſome thin gum water; and then, ſettling the cake of flowers again with a knife, let the papers be laid on again with the board and weight for a minute or two, and then let the papers be turned again and again, till the cake of flowers becomes united, and of the thickneſs of a cake of ſaffron. You will find the flowers to grow darker and darker every time they are turned, till at length the cake will look of a deep Blue tending to a black. From whence a tincture may be eaſily drawn.

During this operation, great care muſt be taken that the fire does not ſcorch the flowers; but that it be as conſtant and gentle as poſſible, which will be a ſure way to bring the flower-cake to a good colour.

If it ſhould be objected, that it will be troubleſome to make this Blue colour; let it be conſidered what pains and nicety there is in gathering and curing of ſaffron, which is ſometimes ſold at thirty ſhillings per pound, and ſeldom comes to three pounds per pound. But this Blue, if it comes up to the colour of ultramarine, will be worth four or five pounds per ounce, eſpecially when it ſtains ſo well as this does.—It would therefore, in all probability, be worth the while to have a piece of ground on purpoſe for this uſe, where nothing elſe but this

anus or cornbottle ſhould be ſown; and, whereas this flower ſaid to be plentiful enough in the fields between Twickenam and Teddington in Middleſex, ſo there might eaſily be ſeed enough procured for that purpoſe in half an hour's time ſow an hundred acres.

As to the manner of cultivating this plant, every knob or head of ſeed muſt be opened before it is ſown, for each head contains a great number of ſeeds; as for the preparing of the ground to receive this ſeed, there need to be no more trouble and expence than common plowing requires; which being done, the ſeed is to be ſown, either at the latter end of Auguſt, which will come up ſoon enough to ſtand the winter, and bloſſom early the May following; or elſe it may be ſown at the end of March, and it will begin flowering the June following.

At either of theſe ſeaſons, after the ground has been well plowed, harrow it in with buſhes, and it will come up in a little time.

As to the choice of this ſeed, it will be neceſſary that it be gathered only in ſuch fields, where you are ſure there grow no corn bottles of any other colour but Blue; and then all the plants which riſe from ſuch ſeed, would produce Blue; but, if they ſhould be gathered in ſuch places where there are varieties of them, then various ſorts are to be expected, as white, red, or purple, although we are ſure we gather the ſeed from ſuch as were truly of a Blue ſort; for, if there is a red flower of the ſame tribe growing near it, the difference of the colour will be ſo intermixed between both, that the ſeed of both will bring a variety from the principal, depending on the colours of both.

BLUE, of the dyers, is one of their ſimple or mother colours, which is uſed in the compoſition of others. It is made of woad, indigo, and a paſtel brought from Normandy, and, of the three, the paſtel is eſteemed the beſt and moſt neceſſary; woad, though of leſs force and effect, yet makes a tolerable colour; indigo only makes a ſpurious colour; yet it may be uſed along with paſtel, if it be well prepared, and be not mixed in too great a proportion. Woad, having but little ſubſtance, can neither be uſed alone, nor is it capable of correcting the indigo, without the aſſiſtance of paſtel. Some dyers heighten their Blue by adding braſil and other woods. The way of brightening Blues is by paſſing the ſtuff, when dyed and well waſhed through lukewarm water, or, which is much better, by working and fulling the dyed ſtuff with melted ſoap, and then ſcowering it well.—Blues are immediately dyed from the whites, without any other preparation than fulling.

The method of making a vat, and preparing hot ſuds for dying linen and woollen BLUE. Have a vat made big enough to contain

tain eight pails of water, wide at the top, and narrow at the bottom; ſeaſon it for a day and night with hot water, and afterwards waſh it out with cold; then cut a four-ſquare hole at about the height of twenty-one inches, and fourteen broad; and have a copper-plate made of the ſame thickneſs with the wood of the vat; nail this upon the hole, placing the nails at the diſtance of the breadth of two fingers one from the other; the nails muſt be ſmall, with broad heads, to prevent its leaking; then place an iron hoop at the top, and another at the bottom of the copper. The hole muſt be made about a hand's-breadth from the bottom of the vat.

When this has been done, plaiſter or brick it about, either leaving or making a hole in the plaiſter or brick-work, wider at the utmoſt end, and a little narrower at that which comes to the copper itſelf; the ſhape of it being like an oven's mouth, that the wood be not injured, when the fire, to heat the vat of ſuds, is put into this vacancy.

Then, for every half pound of indigo you put in, in order to Blue linen or woollen, take in eight pails of water, and into that ſix handfuls of coarſe wheaten bran, ſix or nine ounces of madder, a pound and an half of pot-aſhes; pour them all into a copper, to make ſuds; and, when the liquor boils ſo as to begin to ſwell and bubble up, throw in two or three quarts of cold water, and rake out the fire from under the copper.

Then having ready lime, prepared as the tanners uſe it, plaiſter the inſide of the empty vat with a handful or two of it, and, afterwards, pour all the ingredients out of the kettle into it, and cover it very cloſe.

The day before you do this, you muſt put your indigo to diſſolve in a quart or three pints of water, in a clean veſſel of iron or braſs, adding half a handful of wheaten bran, and half a ladleful of madder, and half an ounce of pot-aſhes, and leave it a whole night over a coal fire; but it muſt not be ſuffered to boil, or grow hotter, than you can bear your hand in it.

You muſt alſo grind it with a peſtle, till it becomes as ſoft as pap, and is quite cleared of all roughneſs or harſhneſs; which being done, it is fit to be put into the vat to the other ingredients.

Then ſtir it about three or four times with a ſtick; then cover it up cloſe, and let it ſtand to ſettle twelve hours; then take off the cover, and put in half a quarter of an ounce of quick-ſilver, and ſtir it about and cover it as before; then let it ſtand to ſettle for ſix hours; after which, throw in a ſmall ladleful of lime-duſt, or powder, or of the ſame that you before plaiſtered the vat with; then cover it cloſe again, and let it ſtand for three hours longer, and then put in half an ounce of pot-aſhes; ſtir it

well about again, and put a coal-fire in the hole before the opper-plate, in order to keep it warm, and let it ſtand three ours longer; after which, nothing is to be added, only ſtir it before, and, in an hour or two after, you may dye with it follows:

Hang five pieces of goods in it, keeping the bran and flour, c. from it with your hand, to prevent its touching the linen much as poſſible; wring the five pieces out one againſt ano-her, then try by feeling with your finger, whether the dye be arſh, or ſoft and ſmooth; if it feels too rough, throw in half n ounce of pot-aſhes; and, if it be too ſmooth, add half a la-leful of lime.

Work the cloth or linen in it for two hours, put in five freſh ieces, and work them like the former; and, when they are ry, wring them a ſecond or third time in the dye, till they ecome of a colour as deep as you would have them.

Your dye may be wrought in this manner, till you have dyed hirty pieces; and, afterwards, if you would dye any woollen vare, ſtockings, or yarn, take a couple of pailfuls of water, nto which put two handfuls of wheaten bran, and an ounce of madder, and a quarter of a pound of pot-aſhes, and hang it ver the fire and boil it to the ſuds as before; then put it into he vat, and, after you have ſtirred it well about, let it ſtand to ettle three hours.

Then try with your finger whether it is harſh or ſmooth; if t be too harſh, add half an ounce of pot-aſhes; and, if too mooth, add half a ladleful of lime, and ſtir it about again.

If you would dye woollen ware alone, without linen, pre-pare a liquor of a ſufficient quantity of hot water, a handful of madder, and a handful or two of wheaten bran; boil them to-gether, and wet the ſilken or woollen manufacture therein, hang them up, and let them drop as long as they will; then put them into the abovementioned dye-vat, letting them lie there till they are tinged of as deep a colour as you would have them.

If you would dye your wares green, they muſt be firſt dyed yellow, with broom or dyers-weed, called, alſo, yellow weed; and then put into the beforementioned Blue-vat; but you muſt take notice that they muſt not be wetted in madder water, as the Blue, and muſt be taken out of the vat, as ſoon as they are dyed enough.

But you muſt be ſure not to dye above half a dozen pair of ſtockings, or a proportionate quantity of other woollen ware, before you put in your linen, which muſt be covered cloſe for half an hour, as ſoon as they have been put in the vat; then they muſt be wrung well about, then it muſt be let to ſettle again,

again, and wrung out again, and afterwards draw them out.

Then ſtir the dye again very well, and add a little lime, or pot-aſhes, according as either of them is wanted; and, after that, let it ſtand to ſettle for two hours, and then put in other goods to dye, which work as before, ſtirring it every two hours.

If you find the liquor does not dye or work well, let it reſt a day and night, keeping the fire to it all the while, and add half an ounce of fœnugreek powdered, and ſtir it well about, and the dye will come to itſelf again.

If you have ſo many things to be dyed, that you have occaſion to augment the quantity of indigo to two or three pounds, yet you need not make your madder, pot-aſh, and bran-liquor, ſtronger than double the quantity of what is above preſcribed for half a pound.

A BLUE *Dye for ſilk.* Procure a tub that may be cloſe covered, put into it a ley made of three pailfuls of river or rain water, and clean beech-aſhes; put in, alſo, two handfuls of wheaten bran, two ounces of madder, two ounces of white-wine tartar beaten to powder, one pound of pot-aſhes, and half a pound of indigo pounded ſmall; ſtir it very well with a ſtick every twelve hours, for fourteen days, till it tinges a ſort of green, and, when the dye is grown bright, it muſt be ſtirred every morning. Put the ſilk into a warm freſh ley, wring it out and ſtir it about in the dye ſome time afterwards, letting it hang in the dye, according to the cuſtom of dying; and, beſides the Blue copper, there ought to be another copper full of ley, that, when the ſilk is wrung out of the dye, it may be rinſed in it; and, after it has been wrung very clean out of that, rinſe it again in river water, beat it and dry it.

If the ſilk be moiſtened in this latter ley or ſuds, before it is dyed, there is no need of the firſt abovementioned ley.

Several ſorts of Blue may be made with this dye, either brighter or darker, at pleaſure, according to the time they are left in it; and, when the copper grows low, you may fill it up again out of the rinſing-vat; but, when the Blue copper or vat grows weak, then put in a quarter of a pound of pounded indigo, and half a pound of pot-aſhes, half an ounce of madder, an handful of wheaten bran, and a quarter of an ounce of tarter pounded; and let it ſtand eight days without uſing it, ſtirring it every twelve hours, and then you may dye with it again as before.

How to prepare a BLUE *Dye.* Put a pailful of water into a kettle that will hold it, hang it over the fire; put in a handful of unſlacked lime, two pounds of indigo, one pound of pot-aſhes, and let them boil together for an hour, letting them diſſolve.

Then,

Then, having made clean a copper that will hold a tun of water, put into it two pounds of madder, two pounds of bran, and two pounds of pot-aſhes; boil them a little, and let them ſettle, and pour the indigo upon them; then ſtrain the ley alſo into the vat, but the indigo, eſpecially, muſt be digeſted very well and diſſolved, and the copper filled with water, covered cloſe, and a fire made under it; ſuffer it to grow warm, but not hot, ſtirring it about every two hours, till it ferments; and, as ſoon as it begins to melt or digeſt, it will alſo begin to turn yellowiſh, and then you may dye with it, taking care that your hands are very clean, and free from all ſorts of greaſe.

When you have dyed with the ſuds, you muſt ſtrengthen them afreſh with pot-aſhes; but you muſt take care to do this neither too much nor too little; for, if you are guilty of either extreme, the whole copperful of ley is ſpoiled.

Neither ought you to dye too often at one time; but, betwixt every time you dye, the liquor muſt be very well ſtirred.

An excellent liquor to make the Blue ſuds work, in caſe it happens that they will not, by reaſon of ſome defect. Take four ounces of madder, four ounces of pot-aſhes, and two handfuls of bran; boil them together, and pour the liquor into the Blue ſuds; ſtir it well about, and it will make it work; and, if it be too much fattened with aſhes, then hang a bag of wheat flour in it, and that will attract all the fatneſs to it; and, if it be yet defective in any particular, add to it a ſmall quantity of ſaltpetre, and that will bring it to a fermentation, as will alſo a little grounds of beer, which indeed is one of the beſt remedies.

BLUE *Japan.* Take gum water, what quantity you pleaſe, and white-lead a ſufficient quantity; grind them well upon a porphyry. Then take iſing-glaſs ſize, what quantity you pleaſe; of the fineſt and beſt ſmalt, a ſufficient quantity; mix them well; to which add of your white-lead, before ground, ſo much as may give it a ſufficient body; mix theſe together to the conſiſtence of paint.

With this mixture do over your work, and repeat this three or four times, till you ſee your Blue lies with a good fair body, letting it dry thoroughly between each time; if the Blue be too pale, put in more ſmalt into the ſize, without any white-lead.

Then rub it very ſmooth, and go over it again with a ſtronger Blue; and, when it is thoroughly dry, waſh it twice over with the cleareſt iſing-glaſs ſize alone; cover it, and let it dry two days.

Then warm the piece gently before the fire, and with a clean pencil waſh your work over with the fineſt white varniſh, repeating it ſeven or eight times, and let it dry two days, as before;

fore; repeat it again the ſecond and third time, and your waſhes ſeven or eight times, in like manner.

Then let it ſtand to dry for a week, and poliſh it as before directed; and, laſtly, to give it a poliſhed and gloſſed appearance, clear it up with lamp-black and oil.

You may make the colour either light or deep, according to your fancy; if it have but a ſmall proportion of the lead, it will be deep; but, if it has a larger, it will be lighter.

Alſo the ſize for laying Blues, white, or any other colour, ought not to be too ſtrong, rather weaker, and juſt ſufficient to bind the colours, to make them ſtick on the work; for, if it be too ſtiff, it will be apt to crack and fly off; and the reaſon of waſhing twice, with clear ſize, is to keep the varniſh from ſinking into, or tarniſhing the colours.

A BLUE *for painting or ſtaining glaſs.* Take of fine white ſand, twelve ounces; zaffer and minium, of each three ounces; reduce them to a fine powder in a bell-metal mortar; then put this powder into a very ſtrong crucible, cover it and lute it well, and, being dry, calcine over a quick fire for an hour; then take out the matter, and pound it well in the mortar, as before; then, to ſixteen ounces of this powder, add fourteen ounces of nitre powdered, mix them well together, and put them into the crucible again, cover and lute it, and calcine for two hours in a very ſtrong fire.

Take it out and grind it as before, then add to it a ſixth part of nitre, and calcine again, as before, for three hours more; then take out the matter with an iron ſpatula red-hot, leſt it ſhould ſtick; it being very clammy, and not eaſily emptied.

To dye barley-ſtraw of a BLUE *colour.* Take a ſufficient quantity of lixivium, or pot-aſhes, and a pound of litmus, or lacmus, ground; make a decoction; then put in your ſtraw, and oil it, and it will be Blue.

To dye wood, horns, or bones, BLUE. Firſt boil them in alum water, then put them into a diſſolution of indigo in urine.

To dye briſtles and feathers BLUE. Firſt boil them in alum water, and after, while they are warm, put them into a tincture of the juice of elder-berries.

To make German BLUE. Take ſal armoniac, two pounds; flowers of ſulphur, three quarters of a pound; quickſilver, half a pound; pound and grind them in an iron or marble mortar, till the mercury is wholly mortified and diſappears; then put it into a glaſs body, well luted up to the middle; ſet it in a very gentle ſand-heat, uncovered, till all the moiſture is vaniſhed. Stop it cloſe, and increaſe the heat gradually, to make the maſs ſublime; ſo will you have an excellent azure or Blue, which grind on a porphyry, to a ſubtile powder, for uſe in painting.

BLUEING,

BLUEING, of metals, is performed by heating them in the fire till they aſſume a blue colour; particularly practiſed by gilders, who blue their metals before they apply the gold and ſilver leaf.

BLUENESS, is the quality of any blue body; or it is ſuch a ſize and texture of the parts, which compoſes the ſurface of a body, as diſpoſes them to reflect the blue or azure rays of light, and thoſe only to the eye.

B. M. VVV. ſignifies Bernardo Malpucci of Mantua, painter and engraver; he engraved in wood with three tools; with the firſt he made the profile, with the ſecond the ſhadows, and with the third the light.

Bol. inventor
Bonaſo ſc. 1545. } ſignifies Julio Bonaſoni, of Bologna.

BOASTING, is repreſented by a woman making a great ſhew, covered with peacock's feathers; with a trumpet in her left-hand, and her right in the air.

The feathers denote pride, the mother of Boaſting; the trumpet alſo intimates ſelf Boaſting, or ſounding one's own fame, being blown by one's own breath; for vain boaſters take delight in publiſhing their own actions.

BODY, as to bear a Body, a term uſed of painting colours; and ſignifies, that the colours are of ſuch a nature, as to be capable of being ground ſo fine, and mixing with the oil ſo entirely, as to ſeem only a very thick oil of the ſame colour.

But ſuch colours as are ſaid not to bear a Body, will readily part with the oil, when laid on the work; ſo that, when the colour ſhall be laid on a piece of work, there will be a ſeparation, the colour in ſome parts, and the clear oil in others; except they are tempered extraordinary thick.

Edward du BOIS, was a hiſtory and landſcape-painter, but chiefly the latter, born at Antwerp. He was diſciple to one Groenwegen, a landſcape-painter likewiſe, who reſided many years in England, and had been ſome time in Italy. Du Bois alſo travelled to Italy, where he continued eight years, during all which time he ſtudied the antiques, and painted after the Italian taſte.

He worked ſome time at Paris, and, in his way to Italy, did ſeveral pieces for Charles Emanuel, Duke of Savoy. Soon after his return to Holland, he came to England, and died in London, about fifty-five years ago, being ſeventy-ſeven years old. He lies buried in St. Giles's church.

B *Rene* BOIVIN, who engraved ſeveral plates of ancient foliages, uſed this mark.

BOLLITO, a name by which the Italians call a ſea-green colour in artificial cryſtal.

This colour is not to be made without a great deal of precaution.

To ſucceed well, you muſt have in the furnace a pot filled with forty pounds of good cryſtal frit, carefully ſkimmed, boiled, and purified, without any manganeſe.

Then you muſt have twelve ounces of the powder of ſmall leaves of copper, thrice calcined, as directed in the article COPPER. And half an ounce of zaffer, in powder, prepared as directed in the article ZAFFER.

Mix theſe powders together, and put them, at four times, into the pot, that they may the better mix with the glaſs, ſtirring them well each time of putting in the powder, for fear it ſhould ſwell too much and run over.

After the whole has been incorporated, well mixed, and pretty well ſettled for two hours, try if the colour is deep enough; if ſo, let it reſt; though the ſea-green, or ſky colour, ſeems at firſt greeniſh, you need not be concerned at it; for the ſalt in the glaſs will conſume all that greenneſs, and change it into blue.

After the metal has ſtood at reſt for twenty-four hours, it may be wrought, and you will have the colour deeper or lighter, according to the quantity of powder you have put into it.

There is no other rule for that but the fancy of the workman, for which reaſon it cannot be aſcertained; beſides, the matter that is uſed for tinging of glaſs, makes it have ſome more colour, ſome leſs, which proceeds from the preparation of it.

OBT *Schelde a* BOLSUVERT, uſed this mark, when he had not a mind to ſubſcribe his name.

To dye BONES, or *horn, green.* Put of filings of copper and verdigreaſe, of each three ounces, into a quart of white-wine vinegar; add a handful of bruiſed rue, mix them well, and put the Bones in this for fifteen days.

To dye BONES, *&c. red.* Firſt, let them be boiled in alum water, then put them into a tincture of braſil in alum water, for two or three weeks, or elſe into a tincture of braſil with milk.

To dye BONES, *&c. blue.* Firſt boil them in alum water, then put them into a diſſolution of indigo in urine.

To dye BONES, *&c. green, like emeralds.* Put as much filings of copper into aqua-fortis as it will diſſolve; then put in bones, horns, wood, and let them lie for one night.

Daniel BOON, was a Dutch droll painter, and a great admirer

dmirer of uglineſs and grimace, both in his ſmall and great pie-es; in which he ſeldom forgot to endeavour to raiſe mirth in is countrymen and ours, of the ſame ſublime genius. He died bout thirty years ago.

DB *David Van* BOONS *inv.* and after this mark we read Oons; his plates were engraven by P. Servator, ſc.

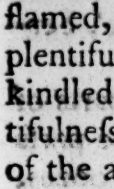
BORAX, is a particular ſalt, brought from ſeveral parts of he dominions of the Great Mogul, in Perſia and in ſome parts f Tartary. In theſe, and other parts of the Eaſt, there oozes, ut of the ſide of hills which contain metals, and particularly opper, a thick turbid water of a bluiſh-grey colour, and of a rackiſh bitter, and very diſagreeable taſte. This, where it runs n ſufficient quantity, is generally taken care of for uſe, being irected in its courſe into wide and ſhallow pits, lined with a iff clay: In theſe it is left expoſed to the ſun, in order to eva-orate, by the people who have the care of it; and, when the rey fine mud, left in its paſſage, is brought to the conſiſtence f a ſoft pap, they throw into it, in the middle of a hot day, a arge quantity of ſome animals fat melted over the fire. This s all well ſtirred together, and then covered with ſticks and oughs of trees; and over there is thrown a cruſt of any com-non clay. Thus it is left till perfectly dried up, then the co-ering is taken off, and the whole ſifted, to ſeparate the earth nd dirt; and in the ſieves is found what is ſent to us under he name of rough Borax, which is in rude irregular maſſes, ut ſomewhat approaching to a priſmatic figure; very foul, arthy, and fattiſh, of a duſky greeniſh colour, and having a particular rank and diſagreeable ſmell.

This is afterwards refined for uſe, by diſſolving it ſeveral imes in large quantities, and cryſtalliſing it, while the liquor is ot and kept cloſe covered from the air; and finally being diſ-ſolved in a lixivium of quick-lime and pot-aſhes, and cryſtal-liſed in the ſame manner, is what we call refined Borax.

Paris BORDONE, born in the year 1512, or 1526, ſcho-lar of Titian, imitated Giorgione, lived at Venice, and in France; excelled in hiſtory and portraits, died aged ſeventy-five years.

BOREAS, the north-wind, is repreſented, in painting, like an old man with a horrible or terrible look; his hair and beard covered with ſnow, or the hoar-froſt, with the feet and tail of a ſerpent.

Francis BOROMEO *da* SAVIGNANO, born in the year 1446, ſcholar to Coſimo Roſſelli, and ſtudied Leonardo da Vinci, lived at Florence; excelled in portraits and hiſtory painting, died in the year 1517, aged forty-eight years.



Cornelius BOSS, on a virgin, engraven by him, is this mark, and underneath, Michael Ang. inv. i. e. Buonaroti.

BOUNTY, is repreſented emblematically by a noble lady, cloathed in a garment of ſky colour, ſtanding by an altar inflamed, preſſing the milk out of her breaſts with both hands plentifully, of which ſeveral animals drink, and ſome upon the kindled altar. The ſqueeſing of her breaſts alludes to the bountifulneſs of her diſpoſition, and ſome of it, falling upon the flames of the altar, denote that Bounty ought to be ſhewn in imitation of God himſelf.

Sebaſtian BOURDON, born in the year 1619, ſtudied in Rome, lived at Rome, Sweden, and Paris; excelled in hiſtory and portraits, died in the year 1690, aged ſeventy years.

To make BRAN *Water, for preparing ſlight ſtuffs for dying.* Put a hatful of wheat Bran into each pail of water, and boil them together for a quarter of an hour; then pour it into a clean tub, where, to every two pailfuls of this liquor, pour in another pail of water, and throw on a handful of leven. The French dyers call theſe waters eaux ſures, i. e. acid or ſharp waters, and, by how much they are the ſourer, account them ſo much the better, and fitter to attract the fatneſs of the ſtuffs, and dry it clean off, to make them limber, and correct the roughneſs of the water.

Giacinto BRANDI, born in the year 1623, a ſcholar of Lanfranc, lived in Rome; excelled in hiſtory, died in the year 1691, aged ſixty-eight years.

BRASIL or BRAZIL, a wood ſo called, becauſe firſt brought from Braſil, a province of South-America. It has various names, according to the places it comes from. Thus we have Braſil of Fernambouc, Braſil of Japan, of Lumon, of St. Martha; and laſtly braſilette, brought from the Antilles.

The Braſil-tree, commonly grows in dry barren places, and in the middle of rocks; it is very thick and large, and uſually crooked and knotty. Its flowers, which are of a beautiful red, exhale a very agreeable ſcent, good for comforting and ſtrengthening the brain.

Though the tree be very large, it is covered with ſo thick a bark, that, when the ſavages have taken it off the wood, a trunk, which was before the thickneſs of a man, is ſcarce equal to that of his leg.

Braſil wood is very heavy, dry, crackles much in the fire, and ſcarce raiſes any ſmoke, by reaſon of its extreme dryneſs.

None of the ſeveral kinds have any pith, except that of Japan. That of Fernambouc is eſteemed the beſt.

It muſt be choſen in thick pieces, cloſe, ſound, without any

bark; and such as, upon being split, from pale, becomes reddish; and, being chewed, has a sugary taste.

It is much used in dying, where it serves for a red colour, but it gives only a spurious colour, and easily evaporates and fades; nor is the wood to be used without alum and tartar. From the Brasil of Fernambouc is drawn a kind of carmine, by means of acids.

There is also a liquid lacca made of it for painting in miniature.

To make lake, or tincture of BRASIL. The Brasil, meant here, is that which the dyers make use of. Take of the finest that comes from Fernambouc, that being the best.

The way of extracting this tincture is the same as that from kermes. See KERMES.

BRASS, or, as the French call it, yellow copper, is a factitious metal, made of copper and lapis calaminaris.

The method of preparing it is as follows: The lapis, having been calcined, and ground fine as flour, is mixed with ground charcoal; and incorporated, by means of water, into a mass: This being done, about seven pounds of the lapis calaminaris are put into a melting-pot that will contain about a gallon; and over that about five pounds of copper; this pot is let down into a wind-furnace, eight feet deep, where it remains for eleven hours, in which time it is converted into brass.

This metal, then, is cast either into plates or lumps; forty-five pounds of crude lapis calaminaris, or calamine, will produce thirty pounds when calcined or burnt.

Sometimes Brass shruff is used instead of copper; but that is not always to be procured in quantities sufficient, it being no other than a collection of old Brass.

Pure Brass is not malleable, unless when it is hot; for, when it is cold, it will break. And, after it has been melted twice, it will be no longer in a condition to bear the hammer at all; but, in order to render it capable of being wrought, they put seven pounds of lead to a hundred pounds of brass, which renders it more soft and pliable.

The best proportion for gun-metal for casting great guns is said to be a thousand pounds of copper, nine hundred pounds of tin, and six hundred pounds of Brass in eleven or twelve thousand weight of metal.

The best Brass guns are made of malleable metal, not of pure copper and calamine alone; but coarser metals are used to make it run closer and sounder, as lead and pot-metal, which last is made of Brass and lead; twenty pounds of lead are usual put into a hundred pounds of pot-metal.

Corinthian BRASS, has been famous in antiquity, and is a

mixture of gold, ſilver, and copper. L. Mummius having ſacked and burnt the city of Corinth, 146 years before our Saviour's time, there being there a vaſt number of ſtatues, images, veſſels, &c. of gold, ſilver, and copper, all theſe melted and run together, by means of the violence of the conflagration; and this mixture was the compoſition called Corinthian Braſs. Thoſe who ſpeak of it accurately, diſtinguiſh it into three kinds; in the firſt, gold is the prevailing metal; in the ſecond, ſilver; in the third, gold, ſilver, and copper are equally blended.

To cleanſe BRASS. Take aqua-fortis and water, of each a like quantity; ſhake them together, and, with a woollen rag dipped therein, rub it over; then, preſently rub it with an oily cloth: Laſtly, with a dry woollen cloth, dipped in lapis calaminaris, and it will be as clear and bright as when new.

To purge BRASS. It is cleanſed or purged by caſting into it, while it is melted, broken glaſs, tartar, ſal-armoniac, and ſalt-petre, each of them by turns, a little and a little.

To calcine BRASS, *called Orpello or Tremolante, making a curious ſea-green or ſky-colour.* Take thin Braſs, cut it into ſmall pieces, put it into a crucible covered and luted at top; ſet it in a fierce fire, where let it ſtand four days in a great, but not melting fire, for, if it melt, your labour is loſt. In four days time it will be very well calcined; then powder it as fine as you poſſibly can, ſearſe it, and the powder will be black; ſpread this on tiles, and keep it on a leer on burning coals for four days, near to the round hole; take away the aſhes that fall upon it, powder and ſearſe it again, and then keep it cloſe ſtopped for uſe.

To know if it be well calcined, put it into glaſs, and, if it ſwells, it is right; if not, it is not well calcined, or elſe it is over burnt; and, if ſo, it will not give a good colour.

To calcine BRASS, *ſo as to make a tranſparent red.* Cut your thin pieces of Braſs ſmall, and put it into a melting-pot, with layers of powder of brimſtone, and metal, as in copper. Set it firſt on kindled coals, then put it into a ſtrong fire in the furnace, to calcine for twenty-four hours; then beat it to a fine powder, and ſearſe it; put it covered into the furnace, on earthen tiles, for twelve days, to reverberate; ſo powder, grind, and keep it for uſe.

Beſides a red, it contributes principally to the making a yellow and chalcedony.

A red colour from BRASS. Put ſmall pieces of it into the arches of the furnace, and let them remain there cloſe till they are well calcined; but in ſuch a fire, that they may not melt; and, when they are well calcined, powder the Braſs, and the powder will be red, and excellent, in many uſes, for colouring glaſs.

The

The way to colour BRASS *white.* Diſſolve two penny-weights of ſilver in aqua-fortis, to which add as much powder of white tartar as will abſorb the water, and make it into balls, with which rub any Braſs, and it will be as white as ſilver.

BRAZING, is the ſoldering or joining two pieces of iron, &c. by means of thin plates of braſs, melted between the two pieces to be joined.

If the work be very fine, as when the two leaves of broken ſaws are to be brazed or joined together again, it is covered with powdered borax moiſtened with water, that may incorporate with the braſs-duſt, which is added to it, and the piece is expoſed to the fire, without touching the coals, till the braſs be obſerved to run.

But, to braze with a ſtill greater degree of delicacy, a ſolder is made of braſs with a tenth part of tin; or another, one-third braſs and two-thirds ſilver; or borax and roſin. But, in all theſe manners of Brazing, care muſt be taken that the pieces be joined cloſe throughout; the ſolder only holding in thoſe places which touch.

HB *Hans* BRESANK, engraved the ſtories of the new teſtament, and, in the year 1619, the twelve apoſtles, our Saviour, and St. Paul. He uſed this mark.

Matthew BRILL, born in the year 1550, lived at Antwerp and Rome, excelled in hiſtory and landſcapes, died in the year 1684, at thirty-four years of age.

Paul BRIL, born in the year 1554, imitated his brother Matthew, afterwards ſtudied Annibal Carrache, and copied Titian, lived at Rome, excelled in landſcapes and hiſtory.

IB I. G. BRONCHORTS, in certain landſcapes, uſed this mark, in which we likewiſe find the letters C. P. i. e. Cornelius Pulemburgh, pinxit.

To extract lake from BROOM *Flowers.* Firſt make a lixivium, or ley, of ſoda of the glaſs-houſe, and freſh quick-lime, which muſt be pretty ſtrong, in which put in the Broom flowers, over a ſmall fire, until all the tincture be drawn from them, the flowers become white, and the ley receive the yellow colour.

Then take out the flowers, and put the ley into a glazed earthen veſſel, to boil, adding thereto as much roche alum as it can well diſſolve; then take it off, and, putting it into a large veſſel, mix it with fair water, ſo the yellow will ſeparate and deſcend to the bottom; let it reſt there a little, and afterwards decant the water off gently, and ſo put in more freſh to it again and again, until the water has drawn off all the ſalt and alum from the lixivium, and it becomes clear.

Thus the colour will be very well cleanſed of the ſalt and alum, and remain exceeding fine and bright; ſpread it on pieces

of white linen, and let it dry in the ſhade on new-baked tiles, and you will have a moſt admirable yellow for painting.

Adrian BROWER, born in the year 1608, a ſcholar of Frans Halls, lived at Antwerp, excellent at boors and drolls, died in 1638, aged thirty years.

Spaniſh BROWN, is a dirty Brown colour, but of great uſe; to ſhadow vermilion, or lay upon a dark ground behind a picture. You may ſhadow yellow berries with it, in the darkeſt places, when you want lake or thick red ink; but do not colour garments with it, unleſs it be old men's gowns. It is beſt and brighteſt when calcined red-hot; but it muſt not be burnt for colouring any hare, horſe, dog, &c. but, for other uſes, it is beſt calcined or burnt; as for colouring poſts, bodies of trees, timber-work, or any dark ground in a picture.

The method of dying BROWNS. Take a ſufficient quantity of water, put it into the copper, and put of red wood ground and nut-galls bruiſed, of each twenty ounces; boil them together, and enter twenty yards of broad-cloth, boiling it for two hours and a half, and keep cooling it with a cooler, for fear of ſpotting; then take it up and air it: Then put in ſixteen ounces of copperas, and enter the cloth again, when it is almoſt ready to boil again, and handle it, letting it boil half an hour, and then cool it. If you would have the colour ſadder, put in more copperas.

To dye a ſad BROWN. Firſt infuſe the cloth or ſtuff to be dyed in a ſtrong tincture of hermodactyls; then put ſaffron and aſhes in a bag ſtratum ſuper ſtratum, upon which put water, two parts, mixed with vinegar, one part; ſtrain out the water and vinegar, being thoroughly hot, fifteen or ſixteen times. In this lixiviate tincture of ſaffron, put the former matter to be dyed, letting it lie a night; then take it out, and, without wringing, hang it up to dry; repeat this working the ſecond and third times.

To dye a BROWN *tawny, or iron-ruſt colour.* Make a ſtrong decoction of walnut-tree leaves in fair water; then put in the matter you would have dyed, and boil it ſome hours with the leaves in the ſaid liquor, and, when it comes out, it will be exactly of a tawny-brown colour.

To make the colour called the London BROWN. Firſt dye twenty yards of cloth of a bright blue; then take ſtale, clear liquor made of wheat bran a ſufficient quantity, a quarter of a pound of ground logwood, and of alum two pounds and a half; mix and boil the cloth two hours and a half, and then cool it; afterwards take freſh liquor make of wheat bran and clear, to which put two pounds and a half of madder, and handle the cloth; let it have a quick fire to a boiling, then cool it; after which,

take

ake a ſufficient quantity of fair water, half a pound of log-wood, a quarter of a pound of braſil ground; then let them oil well, adding ſome urine; then enter the cloth, and han-le it, and let it boil a quarter of an hour; cool it and waſh it well.

To dye woollen a clove BROWN. Boil three pounds of alum, nd two pounds of tartar in a copper; then put in the ſtuff, oil it two hours; then take it out, and put in, together, five ounds of madder, and a pint of wheat bran, ſtirring the liquor hree quarters of an hour, till it is boiling hot; then draw off he water, putting in freſh water, and put in a pound of galls nd the cloth, which boil for an hour; then take it out again, nd put three pounds of copperas into the kettle, and then put n the ſtuff again, and ſtir it about till it is ſufficiently dyed; hen rinſe it.

To dye a laſting and neat purple BROWN. Firſt dye cloth (for light ſtuffs will not bear the price of this dye) a blue, either ight or dark, according as you would have the colour; then oil it, firſt, either with galls and madder, or with galls only; nd after that with copperas.

When it has been well boiled with madder, or with copperas nd madder, or with galls alone, if it be perfectly finiſhed, it will not take any ſtain from wine, vinegar, or urine.

On the contrary, all colours dyed with wood; as, for exam-le, the red or the blue, in which braſil has been uſed, will take ſtains from the weakeſt acids, which will cauſe in them a very viſible change. Indeed, yellow wood is a ſort of exception to this general rule, for its dye does not change ſo ſoon.

To dye barley ſtraw, &c. BROWN. Take a ſufficient quan-ity of lixivium, Indian wood ground, green ſhells of walnuts, of each half a pound; let the ſtraw ſteep four or five days in a gentle heat, and then take them out.

To dye or ſtain wood of a walnut-tree BROWN. Take the green ſhells of walnuts, dry them in the ſun, and boil them in nut oil; and rub the wood with this oil.

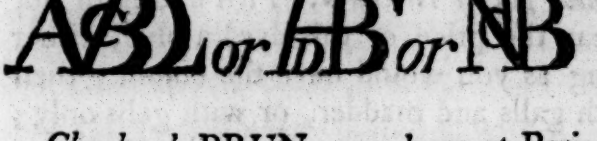
Jan BRUEGHEL, the ſon of old Peter, called *Pluweelen*, or *Velvet Brueghel*, born in 1560, a ſcholar of Peter Goe-kint; ſtudied in Italy, lived at Bruſſels, excelled in wakes, fairs, dances, landſcapes, &c. and in miniature; died in the year 1625, aged fifty-ſix years.

A. D. BRUIN, born in 1560. He engraved ſix of the twelve Cæſars, and various ovals, in 1579, and uſed the firſt of the marks of Nicholas de Bruyn.

BRUSHES. In the choice of Bruſhes, obſerve the follow-ing directions:—Examine whether the briſtles are faſt bound in the ſtocks, and if the hair be ſtrong and lie cloſe together;

for, if they do not lie close, but sprawl abroad, such will never work well; and, if they are not fast bound in the stock, the bristles will come out when you are using them, and spoil your work; as may be seen where the loose hairs of the Brush have lain up and down in the colours laid on, to the great disparagement of the work.—To prevent this, if they are not fast bound, drive in some thin wooden wedges, between the thread with which they are bound round, and this will render the bristles tight and secure.

Wire BRUSHES, are of use for scrubbing those silver, copper, and brass pieces which are to be gilded over, thereby perfectly to free them from any dirt, rust, or filth which may adhere to them; which, not being taken off, would hinder the closing of the gold with them. They are therefore used by gilders, silversmiths, &c. and are usually sold by iron-mongers.



Nicholas de BRUYN He used three marks annexed at different times.

Charles le BRUN, was born at Paris, anno 1620, and he began his studies under Simon Voüet, and finished at Rome by the favour of Monsieur the chancellor Sequier, who sent him thither with a considerable pension for three years; the first proofs of his abilities, after he returned home, were the prize-pieces he made two years successfully for the church of Notre Dame; and his performances soon afterwards, in several of the fine houses in France, gave such a lustre to his pencil, that the King, upon the recommendation of Monsieur Colbert, made him his chief painter, ennobled him, and honoured him with the order of St. Michael. He had a genius, lively, penetrating, and equal to every thing he undertook; his invention was easy, and his talent (excepting in landscapes only) universal.

He was not indeed admired for his colouring, nor for his skill in the distribution of his lights and shadows; but for a good gusto of design, an excellent choice of attitudes, an agreeable management of his draperies, a beautiful and just expression, and withal a strict observance of the decorum of his compositions, which will command the attention and admiration of the nicest judges.

His capital works are the cieling of the gallery and grand stair-case of Versailles, and his five large pieces, containing the history of Alexander the Great, the prints of which are, alone, enough to render his name famous to posterity. He had the superintendency of the manufactures at the Gobelines, and, for some years, governed all the king's artificers. He died in France anno 1690, ætat. 70.

B. S.

B. S. ſignifies Bartholomew Skenius, or Bononenſis ſculptor.

Joſeph BUCKSHORN, was a Dutch painter, born at the ague, who came over to England about the year 1670. He as eſpecially eminent for his copies after Sir Peter Lely, whoſe anner he came ſo near, that ſeveral heads of his have been ken, by good judges, for that great maſter's. He copied o Van Dyck, and the lord Rockingham had the picture of e earl of Strafford, done by him after that great painter. He as Sir Peter Lely's drapery-painter for many years, and died London, at the age of thirty-five, and lies buried in St. Mar-'s church.

BUILDINGS, as towns, caſtles, ruins, &c. are painted as llows: 1. Thoſe towns or cities which ſeem to be far off, uſt have but little ſhadowing or heightening, and ſometimes ne at all; theſe, if they appear againſt the ſky, muſt be laid th bice and a little purple, and ſhaded faintly with a good blue.

2. Thoſe which are ſituated ſomething farther diſtant, muſt laid with blue and purple as aforeſaid, and ſhaded with light ue, and heightened with white.

3. Thoſe which appear at any ordinary diſtance, muſt be laid ith vermilion and purple, and ſhaded with a ſtrong purple, ixed with white.

4. Thoſe which are near, muſt be done with vermilion and hite, and ſhaded with a ſtrong vermilion, and brown oker, ixed with white.

Stone BUILDING [to paint in miniature.] Dead-colour or round, with indigo, biſtre, and white, and then ſhade with fs of this laſt, and more of the biſtre and indigo, according to e colour you would have the ſtones; you may, if you pleaſe, dd a little oker, both to begin with and to finiſh.

But, to add ſtill to its beauty, you ſhould here and there, eſpeially for ruins, make teints of blue and yellow; the former of ontramarine, and the latter of oker, always mixing them with hite; whether for the firſt ground, provided they appear rough what you lay upon them, or whether you uſe them at aſt, finiſhing and blending them with the reſt.

Wooden BUILDINGS, as they are of different kinds, they are eft to diſcretion; but the moſt uſual way is to begin with a ixture of oker, biſtre, and white; and finiſh without white, r with but very little; and, when the ſhades require, ſtrengthen ith biſtre alone.

For others, you may add ſometimes vermilion, or ſometimes reen or black; in a word, according to what you intend, you uſt mix your colour, and finiſh with ſtippling.

BURNING *of colours*. There are ſeveral colours that require burning; as firſt lamp-black, which is a colour of ſo grea-

ſy a nature, that, except it is burnt, it will require a long time to dry.

The method of burning, or rather drying lamp-black, is as follows: Put it into an iron ladle or a crucible, and ſet it over a clear fire, letting it remain till it be red-hot, or ſo near it, that there is no manner of ſmoke ariſes from it.

Umber, which if it be intended for colour for an horſe, or to be a ſhadow for gold, muſt be burnt, which fits it for that purpoſe.

In order to burn umber, you muſt put it into the naked fire in large lumps, and not take it out till it it thoroughly red-hot; if you have a mind to be more curious, you may put it into the fire in a crucible, till it be red-hot; then take it out, and, when it is cold, lay it up for uſe.

Ivory alſo muſt be burnt to make a black, thus: Fill two crucibles with ſhavings of ivory; then clap their two mouths together, and bind them faſt with an iron wire, and lute the joints cloſe with clay, ſalt, and horſe-dung well beaten together; then ſet it in a fire, covering it all over with coals, and let it remain in the fire, till you are ſure the matter incloſed in the crucibles is thoroughly red-hot; then take it out of the fire, but do not open the crucibles, till they are perfectly cold; for, if you ſhould open them while hot, the matter would flame and turn to aſhes; which will alſo be the caſe, if the joints are not luted cloſe; for it is only the excluſion of the air that prevents any burnt matter whatever from turning to a white aſh, and preſerves the blackneſs.

BURNING *Glaſſes*. A machine by which the ſun's rays are collected into a point; and by that means their force and effects heightened to that extreme degree, as to burn objects placed in them.

They are of two kinds, either convex or concave; the convex tranſmit the rays of light, and in their paſſage refract or incline them towards its axis; having the property of lens's, and acting according to the laws of refraction; the concave, which are the more uſual, are very improperly called Burning glaſſes, being uſually made of metal; theſe reflect the rays of light, and, in that reflection, incline them to a point in their axes; having the properties of mirrors, and acting according to the laws of reflection.

Every concave, mirror, or ſpeculum, collects, in rays diſpers'd through its whole concavity, after reflection into a point or focus, and is therefore a Burning mirror.

Hence, as the focus is there, where the rays are moſt cloſely contracted, if it be a ſegment of a large ſphere, its breadth muſt not ſubtend an arch above eighteen degrees; if it be a ſegment of a ſmaller ſphere, its breadth may be thirty degrees.

M. Kircher is of opinion, that thoſe Burning mirrors, which do

not in their breadth ſubtend an arch of more than eighteen degrees, are the beſt of all others.

As the ſurface of a mirror, which is a ſegment of a larger ſphere, receives more rays than another of a leſs; if the breadth of each ſubtend an arch of eighteen degrees, or even more or leſs, provided it be equal, the effects of the larger mirror will be greater than thoſe of the leſſer. And, as the focus is confined between the fourth and fifth part of the diameter, mirrors that are ſegments of greater ſpheres will burn at a greater diſtance, than thoſe which are ſegments of the leſſer.

And ſince the burning depends upon the uniting or union of the rays on the concave, ſpherical figure; it is not to be wondered at, that even wooden mirrors gilded, or ſuch as are prepared of alabaſter, &c. covered with gold, nay even ſuch as are made of paper, and covered with ſtraw, ſhould be found to burn.

BURNISHING, is the art of ſmoothing or poliſhing a body by a violent rubbing it with any thing.

Thus book-binders burniſh the edges of their books by rubbing them with a dog's tooth. Gold and ſilver are burniſhed with a wolf's tooth, a dog's tooth, the blood-ſtone, tripoli, a piece of white wood and emery.

BURNISHER, a round poliſhed piece of ſteel, ſerving to ſmooth and give a luſtre to metals.

BUST } [in ſculpture, &c.] a term uſed for the portrait
BUSTO } or figure of a perſon in relievo; ſhewing only the head, ſhoulders, and ſtomach, the arms being lopped off, uſually placed on a pedeſtal or conſole.

The Buſt is the ſame that the Latins called Herma, from the Greek Hermes, Mercury; the image of that god being frequently repreſented in this manner by the Athenians.

Buſt is alſo uſed, eſpecially by the Italians, for the trunk of an human body, from the neck to the hips.

BUSTLER was a Dutchman, both a hiſtory and face painter in the reign of king Charles II. There is a good picture, partly performed by him, in Mr. Elſum's poſſeſſion and was formerly, which conſiſts of three boors playing together in different actions by Mr. Buſtler, a good landſcape behind by Mr. Lanckrinck, and a little dog on one ſide by Hondius.

How to take the impreſſion of any BUTTERFLY *in a minute in all colours.* Kill the Butterfly, but take care not to injure the wings, but ſpread them open in a flying manner as exactly as may be; then take a piece of white paper, and, with a ſmall bruſh or pencil, waſh a part of the paper with gum-water, a little thicker than ordinary; ſo let it dry leiſurely; then lay the Butterfly on the paper, and, when you have fixed it well, cut away the body cloſe to the wings, and throw it away;

away; (that the preſſing of the body may not ſqueeſe out the intrails, and ſpread and ſmear the impreſſion) then lay the paper on a ſmooth board, with the wings of the Butterfly upwards, and on the fly another paper, and a ſmooth trencher upon that; and put the boards, paper, and wings all together into a linen ſcrew-preſs, and ſcrew it down very hard, and let it ſtand in it for an hour; and then take off the Butterfly's wings, and there will remain on the paper their perfect impreſſion in all their beautiful colours. But, if you have not a ſcrew-preſs, lay weights upon your uppermoſt board, and it will come off very well.

The reaſon of this is, that all the fine colours that appear on the wings of a Butterfly, are a ſort of fine feathers, or rather a powder, which ſticks ſo faſt to the gum, that, when the gum is dry, they leave the wing.

After you have thus gotten the beautiful wings, you may draw the body, &c. of a Butterfly, and colour the drawing of it after the life.

Nicholas BYER, was a hiſtory and face painter, born at Dronthem in Norway. He was much employed by the late Sir William Temple, at his houſe at Shene, near Richmond, in Surrey, where he died about ſixty-ſix or ſixty-ſeven years ago. He was a painter of good hopes, but died young, the effect of an intemperate life. He lived with Sir William three or four years, during all which time, he was conſtantly employed by him in one ſort of painting or other. One thing is remarkable in him, and that is, that he was the firſt man that was buried in St. Clement's Danes, after it was rebuilt, and which had been firſt built by his countrymen.

C.

C. B. ſignifies Cornelius Boſs. This artiſt engraved Julio Romano's Bacchanal.

C. *Bl.* } ſignifies Cornelius Bloemart, ſon of the famous
Born. Blo. } Dutchman, Abraham Bloemart.

C. *Bleher*, the mark of Cornelius Bleher in certain hiſtorical landſcapes, 1636.

CALAMINARIS *Lapis*, or Calamine ſtone, in natural hiſtory, the name of a mineral ſubſtance, which is properly the ore of zink. It is a ſpungy ſubſtance of a lax and cavernous ſtructure, yet conſiderably heavy. It is found in maſſes of various and irregular figures, with rugged protuberant and cavernous ſurfaces; there are of all ſizes from an ounce to ten or twelve pounds weight, and often much more than that.

There

There are no certain ſigns to direct the miners where to find his mineral ſubſtance; only they expect none in grounds that have no communication with hills. In the Calamine works they uſe the ſame way and inſtruments as they do in the lead mines. When they have landed a good quantity of it, which is done by winding it up in buckets from their works, they next carry it away to places where they waſh clean or ruddle it, as they term it, which is performed in this manner: A ſmall piece of ground is incloſed with boards or turfs, through which a clear ſtream of water runs; within this incloſure they ſhovel their Calamine with the reſt of the impure and earthly parts, which laſt are waſhed away by the running water, leaving the lead (ſome of which is always found in theſe apertures) Calamine and heavier ſtony or ſparry parts behind. When they have thus waſhed it as clean as they can, by turning and ſtirring it often in the running ſtream, they remove the bigger parts both of the lead and Calamine, and put the ſmaller parts, that none of the ore may be loſt, into ſieves with bottoms made of ſtrong wire; this they dip and ſhake up and down in a great tub of water, by which ſhaking of the ſieves, the parts of the lead, being heavieſt, ſink down to the bottom; the parts of the Calamine in the middle, and other parts, riſe to the top, which laſt being ſkimmed off and thrown away, they then take off the Calamine, and after that the lead. The Calamine is next ſpread on a board, in order to pick out with the hand what traſh there ſtill remains among it.

When the Calamine is ſufficiently prepared by waſhing and picking, they carry it to the oven, which reſembles that of a baker's in form, but is much bigger, and has a hearth on one ſide, which is ſeparated from the reſt by a partition made open at the top, whereby the flame paſſes over, and bakes the Calamine. They let it lie in the oven four or five hours, during which time they turn it ſeveral times with long iron rakes; when it is ſufficiently burnt, baked, and dried, they beat it to a powder with long iron hammers, like mallets, upon a thick plank, picking out what ſtones they find amongſt it; ſo that at laſt the Calamine is reduced to duſt, to be uſed in diſtemperatures of the eyes.

Paolo CALIARI *Veroneſe*, born in the year 1532, ſcholar of his uncle Antonio Badile, lived at Venice, excelled in hiſtory and portraits, died in the year 1588, aged fifty-ſix years.

CALLIOPE, one of the muſes, the preſident of heroic poetry, is repreſented, in painting, with a coronet of gold upon her head, and upon her left arm garlands of bays in ſtore, for the reward of poets; and in her right hand three books, on which are written, Homerus, Virgilius, Ovidius.

CB *Gio* or *John Baptiſta* CALLESTRUCCI, an engraver, who is inſerted in the catalogue of Roman painters in the year 1652, uſed this mark.

CALKING } a term uſed in painting, &c. where the
CALQUING } back-ſide of any deſign is covered with a black or red colour; and the ſtrokes, or lines, traced through on a waxed plate, wall, or other matter; by paſſing lightly over each ſtroke of the deſign with a point, which leaves an impreſſion of the colour on the plate or wall.

CALUMNY, is repreſented, in painting, by a beautiful, rich, and young woman, approaching towards a judge in a gorgeous habit, with an angry, ſcornful, and diſcontented look, and red and fiery eyes; holding in her left hand a flaming torch, and, with her right hand, ſhe by force draws a young man by the hair of the head.

Luca CANGIASI, or CAMBIASO, born in the year 1527, ſcholar to his father, lived at Genoa and in Spain, excelled in hiſtory, died in 1683, aged fifty-ſix years.

CAMERA OBSCURA, i. e. a dark chamber, is a machine or apparatus, repreſenting an artificial eye; whereon the images of external objects are exhibited diſtinctly, and in their native colours, either invertedly or erect.

The uſe of this machine is manifold; it ſerves to many good purpoſes in explaining the nature of viſion; and hence it is that it is by ſome called the artificial eye.

It affords very diverting ſpectacles, both by exhibiting images perfectly like their objects, and each cloathed with their native colours; and by expreſſing at the ſame time all their motions, which latter no art can imitate.

The theory of the Camera Obſcura is contained in the following propoſition:

If an object A B (fig. 1. plate I.) radiate, through a ſmall aperture C, upon a white wall oppoſite thereto, and the place of radiation behind the aperture *b* C *a* be dark; the image of the object will be painted on the wall in an inverted ſituation.

Demonſtration. For, the aperture C being very ſmall, the rays iſſuing from the point B will fall on *b*; thoſe from the points A and D will fall on *a* and *d*: Wherefore, ſince the rays iſſuing from the ſeveral points are not confounded, when reflected from the wall, they will carry with them a certain ſpecies of the object, and exhibit its appearance on the wall.

But, ſince the rays A C and B C interſect each other in the aperture, and the rays from the loweſt parts fall on the higheſt, the ſituation of the object will of neceſſity be inverted.

Corollary. Since the angles at D and *d* are right, and the vertical ones at C are equal, B and *b* and A and *a* will be alſo equal;

qual; conſequently, if the wall whereon the object is delinea-
d, be parallel to it, it will be *a b* : A B : : *d* C : D C; that
the height of the image will be to the height of the object,
the diſtance of the object from the aperture is to the diſtance
the image from the ſame.

Conſtruction of a CAMERA OBSCURA, *wherein the images of
ternal objects ſhall be repreſented diſtinctly, and in their genuine
lours, either in an inverted, or an erect ſituation.*

1. Darken a chamber, one of whoſe windows looks into a
lace ſet with various objects, leaving only one little aperture
pen in the window.

2. In this aperture fit a lens, either plano-convex, or con-
ex on both ſides, to be a portion of a large ſphere.

3. At a due diſtance, to be determined by experience, ſpread
paper or white cloth, unleſs there be a white wall for the
rpoſe; for on this the images of the deſired objects will be
lineated invertedly.

4. If you would rather have them appear erect, this may be
one either by means of a concave lens, placed between the
nter and the focus of the firſt lens; or by receiving the image
n a plane ſpeculum, inclined to the horizon under an angle of
5°; or by means of two lens's included in a draw tube inſtead
one.

Note, that, if the aperture do not exceed the bigneſs of a pea,
e objects will be repreſented, even tho' there be no lens at all.

To render the images clear and diſtinct, it is neceſſary that
e objects be illumined by the ſun's light; they will be ſtill
righter, if the ſpectator firſt ſtay a quarter of an hour in the dark.

Care muſt be likewiſe taken, that no light eſcape through
ny chinks; and that the wall be not too much illumined.

Farther, the greater diſtance there is between the aperture
nd the wall, the larger and more diſtant will the images be;
ut, the rays becoming thus too much dilated, the brightneſs of
e image is weakened, till at length it becomes inviſible.

Conſtruction of a portable CAMERA OBSCURA.

1. Provide a little cheſt or box of dry wood, in the figure of
a parallelopipedon, in breadth about ten inches, and its length
wo feet or more, according to the different magnitude of the
iameter of the lens. See plate I, fig. 2.

2. In the plane A C, fit a ſliding tube E F with two lens's,
or to ſet the image at a leſs diſtance from the tube with three
lens's convex on both ſides; the diameter of the two outer and
forwarder to be $\frac{60}{100}$ of a foot; that of the inner leſs, v. g. $\frac{40}{100}$.

3. Within the cheſt, at a proper diſtance from the tube, ſet
up an oiled paper perpendicularly G H, ſo as that images
hrown upon it may be ſeen through.

4. And

4. And laſtly, make a round hole in I, ſo as a perſon may look conveniently through it with both eyes.

If then the tube be turned towards the objects (the lens's being at their proper diſtance, which is to be determined by experiment) the objects will be delineated on the paper G H as before.

Another portable CAMERA OBSCURA.

1. In the middle of a ciſtula or cheſt, (ſee plate I, fig. 3.) raiſe a little turret, either round or ſquare, as H I, open towards the object A B.

2. Behind the aperture, incline a little plain mirror *a b* to an angle of 45, which may reflect the rays A *a* and B *b* upon a lens convex on both ſides G, included in a tube G L.

3. At the diſtance of the focus of it, place a table, covered with a white paper E F, to receive the image *a b*.

4. And laſtly, in N M make an oblong aperture to look through.

By means of this inſtrument, a perſon, unacquainted with deſigning, will be able to delineate objects to the laſt accuracy and juſtneſs; and another, well verſed in painting, will find many things herein to perfect his art.

DO CAP *Domenico* CAMPAGNOLA, a Venetian, and ſcholar to Titian, uſed this mark; we meet with ſome of his pieces engraved in 1518. His Brother Julio was alſo an engraver.

Annibal CARACCI, born in the year 1560, ſcholar of Lod. Caracci, ſtudied Correggio, Titian, Raphael, and the antique; lived at Bologna and Rome, excelled in hiſtory, died in 1609, aged forty-nine years.

Antonio CARACCI, called *Il Gobbo*, born in 1583, ſcholar of Annibal Caracci, lived at Rome, excelled in hiſtory, died in 1618, aged thirty-five years.

Lodovico CARACCI, born in the year 1557, ſcholar of Proſpero Fontana, and ſtudied Parmegiano, Titian, &c. lived at Bologna and Rome, excelled in hiſtory, died in 1619, aged ſixty-four years.

Auguſtino CARACCI, born in the year 1557, ſcholar of Dominico Tebaldi, Aleſſ. Minganti, and his couſin Lodovico; lived at Bologna, Rome, and Parma, excelled in hiſtory, died in the year 1602, aged forty-five years.

Polydoro da CARAVAGGIO, born in 1495, ſtudied Gio. d'Udine and Matturino; lived at Rome, Naples, and Meſſina; excelled in hiſtory and architecture; died in the year 1543, aged forty-eight years.

CARBUNCLE, the name of a gem very commonly uſed, but very little underſtood. The diſtinguiſhing character of the

the Carbuncle is, that it is a gem of great hardneſs, and of a deep red with a mixture of ſcarlet. It was known among the ancients by the name anthrax, which was uſed metaphorically, to ſignify that this gem was in ſome lights of a fire colour; the proper ſignification of the word being a lighted charcoal, the Latin name is a tranſlation from the Greek, and moſt nations have agreed to call it by a name of the ſame ſignification.

Our jewellers, among whom it is very rare, know it by no peculiar name, and not only now, but for many ages back this has been the caſe; and, while the genuine Carbuncle was often ſeen, it was yet generally thought not to exiſt, and this merely from an error. Its name importing a reſemblance to a burning charcoal, the world in general grew into an opinion of its having the properties of a burning coal, one of which is the ſhining in the dark; and, ſuppoſing that property ſtrongly commemorated in the name, and finding no gem which had it, they took it for granted the Carbuncle no longer exiſted; nay, the fertile imaginations of ſome travellers have gone ſo far as to affirm, that a gem with this property is yet to be ſeen in ſome places, and have given a thouſand abſurd relations of it.

To all this it is only to be anſwered, that the whole is an abſurd error; for that the ancients never attributed any ſuch quality to their Carbuncle, but that the whole reaſon of their giving the name anthrax to that gem was, that it was of itſelf of a very deep and ſtrong red; but, when held up againſt the ſun, or when ſet upon a bright pale foil, it was exactly of that ſort of red colour, which is ſeen in burning charcoal.

Artificial CARBUNCLE. Take ten ounces of matter prepared with ſaturnus glorificatus, and natural cryſtal reduced to an impalpable powder; add to this half an ounce of crocus martis, in fine powder prepared. (See CROCUS, *&c.*)

Mix theſe powders well together, and put them into a good crucible, which cover and lute well; then put it into a glaſs-houſe fire for three days, putting it nearer and nearer the ſtrength of the fire by degrees.

Then take out the crucible, and put the matter into a marble mortar; then pound and grind it very ſmall, with its weight of ſal gemmæ, and put it into another crucible, which cover and lute as before.

Being dry, put it into the ſame glaſs-houſe furnace, removing it nearer to the fire by little and little, and let it ſtand for twenty-four hours in a good fuſion.

Then take it out, and put it into the furnace to bake again, as you do glaſs, where leave it twelve hours, that it may cool gently.

When the crucible is cold, take it out of the furnace to bake

again, then break it, and you will find in it the matter tinged of a very fine Carbuncle colour, which you may cut of what form you pleaſe; poliſh it at the wheel, and it will be perfect.

CARE, though it commonly makes one old, yet ſhe in painting is repreſented ſo as to appear comely; ſhe is winged, holding two hour-glaſſes, a cock at her heels, and the ſun riſing from the ocean.

Her handſomeneſs denotes her taking time by the forelock, and ſtopping all good things; the wings denote quickneſs; the glaſſes and ſun ſhew that care and ſolitude are never weary.

CARICATURA's, in painting, as to make Caricatura's, is to exaggerate the defects, and conceal the beauties in perſons faces; however preſerving the reſemblance.

John CARINGS, was an Engliſh landſcape-painter, who lived the better part of his time in Holland, and drew many views of that country in a manner very neat and elaborate. His pieces bore a great price in his life-time, but, having little beſides their neatneſs to recommend them, they have ſince been leſs eſteemed. He died at Amſterdam about the year 1646.

Anne CARLISLE, was an Engliſh gentlewoman, contemporary with Van Dyck. She copied the Italian maſters ſo admirably well, that ſhe was much in favour with Charles I, who became her patron, and preſented her and Sir Anthony Van Dyck with as much ultramarine as coſt him above 500 l. She died in London about ſeventy-two years ago.

CARLO (called *Carlino*) *Dolci*, born in the year 1616, ſtudied Jacopo Vignali, lived at Florence, excelled in hiſtory.

CARMINE, a red colour, very vivid, bordering ſomewhat on the purple, uſed by painters in miniature; and ſometimes painters in oil, though rarely, by reaſon of its great price.

Carmine is the moſt valuable product of the cochineal meſtique; which is a fæcula or ſediment, reſiding at the bottom of the water, wherein cochineal, conan, and antour have been ſteeped: Some add rocou, but this gives Carmine too much of the oval caſt.

That which is good is almoſt in an impalpable powder.

Some make Carmine with braſil wood of fernambouc, and leaf gold beat in a mortar, and ſteeped in white-wine vinegar; the ſcum ariſing from this mixture, upon boiling, when dried, makes Carmine; but this kind is vaſtly inferior to the former.

Another CARMINE. Steep a pound of braſil wood, of fernambouc of the colour of gold, for three or four days in an earthen veſſel or pot of white-wine vinegar; after having broken it well in a mortar, boil it half an hour.

Then paſs or ſtrain it through a very coarſe linen cloth, and ſet it again upon the fire.

Take

Take another little pot of white-wine vinegar, and in it ſteep or temper eight ounces of alum. Put this alum ſo tempered in the other liquor, and ſtir it about well with a ſpatula.

The ſcum or froth which ariſes is the Carmine; take it off as it riſes, and let it dry. The ſame may be done with cochineal inſtead of braſil.

Another CARMINE. Take three pints of ſpring water, which has not paſſed through leaden pipes; put it into a glazed earthen pot, and ſet it on the fire.

When it is ready to boil, put in half or a quarter of an ounce of the grain of cohan or dyer's red, which the feather-dyers uſe, reduced to a fine powder.

Then boil it for about three quarters of an our, or till the fourth part of the water be conſumed. Let the fire be of coals.

Then ſtrain this water through a linen cloth into another well glazed veſſel, and ſet it on the fire till it begins to boil; then put in an ounce of cochineal, and a quarter of an ounce of arnotto, both reduced to powder apart; and let this liquor boil away to one half, or rather till it raiſes a black ſcum, and is very red; for it takes a colour by being boiled.

Then take it off the fire, and ſtrew into it half an ounce or three pinches of roche alum, or Roman alum, pulveriſed, which laſt is reddiſh and better; and, about half a quarter of an hour after, ſtrain it through a linen cloth into a veſſel well glazed, or you may divide it in ſeveral ſmall Dutch glazed porringers, in which let it ſtand to ſettle for twelve or fifteen days, and there will appear on the ſurface a mouldy ſkin, which you are to take off with a ſpunge, and expoſe the matter underneath to the air.

When the watery part on the top is evaporated, dry the matter which remains at the bottom, and grind it upon a very hard and ſmooth marble ſtone or porphyry, and then ſift it through a very fine ſieve.

The quantities of theſe ingredients are not ſo fixed to the proportion before directed, but that you may put in either more or leſs of them at diſcretion, according to the depth or degree of colour you deſire.

If you would have the Carmine redder, you may put in more arnotto; if more of a crimſon, more cochineal; but all of them muſt be reduced to powder ſeparately, and the grain of cohan or dyer's weed muſt firſt be boiled alone, and the other altogether as before directed.

CARNATIONS, in miniature. It is the ſame with carnations and pinks, as with anemonies and tulips (both which ſee) for ſome of them are variegated or mixed with ſeveral colours, and ſome of them are of one ſingle colour.

The firſt are ſometimes ſtreaked, ſtriped, or marked, ſome-

times with vermilion and carmine, and ſometimes with lake; at other times with pure lake, or with white. Some are deep, others are pale; ſometimes they are variegated with ſmall or narrow ſtrokes: Their grounds are commonly ſhaded with indigo and white.

In ſhort, there are a great variety of theſe flowers, which nature herſelf, or your own fancy, will direct you to repreſent.

The green of all of them is of the ſea hue, and ſhaded with iris green.

CARNATION, i. e. fleſh-colour, in painting, is underſtood of all the parts of a picture in general which repreſent fleſh, or which are naked without drapery.

Titian and Corregio, in Italy, and Rubens and Van Dyke, in Flanders, excelled in Carnations.

There is ſo great a variety in colouring for fleſh, that it is hard to lay down any general rules for inſtruction therein; neither are any rules regarded by thoſe who have acquired a ſkill this way, for they copy from originals, or work by their own heads, without knowing particularly why or wherefore; ſo that the moſt able hands, who work with the leaſt thought and trouble, would be ſo much the harder put to it, if they were called upon to aſſign a reaſon for their practice and teaching, as to their colouring and tints.

Nevertheleſs, as beginners ſtand in need of immediate inſtruction, I ſhall here, in general, ſhew how you are to paint the different ſorts of fleſh.

Firſt then, having drawn your figure with carmine and adjuſted your piece, you muſt lay on, for women, children, and, in general, for all ſoft and tender colouring, white, mixed with a little blue, for faces, the compoſition of which will be given hereafter; but it muſt hardly appear.

And, for men, inſtead of blue uſe vermilion for your dead-colouring, and, when they are old, let it be mixed with oker.

Then you are to run over all the features with vermilion, carmine, and white, mingled together, and form all the ſhades with the ſame mixture, adding white as they weaken, uſing ſcarce any of it as they ſtrengthen, except in certain places, where it muſt be laid on boldly; as for example, at the corners of the eyes, under the noſe, the ears, under the chin, between the fingers, in all the joints, the corners of the nails, and generally in every part where it is neceſſary to expreſs a ſeparation in the dark ſhades; nor need you fear to give them all the ſtrength which they ought to have from the firſt ſketch, becauſe, in working thereon with green, it conſtantly weakens the red which was firſt laid on.

Having drawn with red, make blue tints with ultramarine and

nd a good deal of white, upon the temples, beneath, and at the corners of the eyes, on each ſide of the mouth, above and below it, a little upon the middle of the forehead, between the noſe and the eyes, on the ſides of the cheeks, on the neck, and other parts where the fleſh has a bluiſh caſt.

Alſo you muſt make yellowiſh tints with oker, orpiment, and a little vermilion, mixed with white, above the eye-brows, at the ſides of the noſe towards the bottom, a little beneath the cheeks, and the other parts near.

In theſe it is that you muſt well obſerve nature, for, painting being no more than an imitation of nature, every deviation from her is a blemiſh, and truly a fault.

Now, having dead-coloured, drawn, and diſpoſed of your tints, you muſt proceed to ſhade, ſtippling with green for your fleſh, mixing therewith, according to the rules preſcribed for tints, a little blue for the fading parts, and on the contrary a little yellow for the ſtronger parts, or ſuch as are neareſt to you. On the extremities of the ſhades, next to the lights, you muſt imperceptibly blend your colour with the ground of the fleſh, firſt with blue, then with red, agreeable to the part you are upon; and, if this mixture of green does not darken enough at firſt, you muſt go over the ſhades with ſeveral repetitions, ſometimes with red, and ſometimes with green, always ſtippling till the whole be perfect.

And, if with the colours you cannot give your ſhades all the ſtrength they ought to have, you may finiſh the darkeſt parts with orpiment, oker, or vermilion, and ſometimes with biſtre only, according to the colouring you would make, but lightly, laying it on very thin.

You muſt ſtipple upon the lights with a little vermilion or carmine, mixed with a good deal of white, and a very little oker, to loſe them with into the ſhades, and make the tints die away imperceptibly into each other, taking care, while you are ſtippling or hatching, that your ſtrokes follow the outline of the fleſh; for, although your hatching muſt croſs in all directions, that ought to appear a little more, becauſe it rounds off the parts.

And, becauſe this mixture might make the colouring too red if it was always uſed, moreover you muſt endeavour to confound the tints and the ſhades with a blue, a little green, and a great deal of white, ſo that it be very pale; but with this you muſt not work upon the cheeks, nor upon the extremities of the lights, no more than with the other mixture upon theſe laſt, which are to be left in all their brightneſs, as certain parts of the chin, of the noſe, upon the forehead, and upon the cheeks, which, and the chin, ought however to be redder than the reſt,

as well as the feet, the inſide of the hands, the fingers, and the toes.

Obſerve here, that theſe two laſt mixtures ought to be ſo very pale, that you ſhould hardly ſee yourſelf work, they being purely deſigned to ſoften the piece, to melt the tints into each other, to blend the ſhades with the lights, and to deface the lines; be careful not to make much uſe of the red mixture upon blue tints, nor of blue upon others; but change colour from time to time, as you perceive your work too blue or too red, till the piece be finiſhed.

The various colourings for Carnations may be eaſily produced by taking more or leſs red, blue, yellow, or biſtre; whether for the firſt colouring or for finiſhing the colouring for women ſhould be bluiſh; for children a little red, both freſh and gay; and for the men it ſhould incline to yellow, eſpecially if they are old.

Of dying a CARNATION, *or red roſe colour.*

To dye a red roſe CARNATION, *or blood red.* Take liquor of wheat bran, a ſufficient quantity; alum, three pounds; tartar, two ounces; boil them, and enter twenty yards of broad-cloth, let it boil three hours, cool and waſh it; take freſh clear bran-liquor a ſufficient quantity, madder four pounds; boil and ſadden according to art. Or,

Take running water four gallons, pot-aſhes two pounds; mix and digeſt forty-eight hours; this done, divide the liquor, half into one pot, and half into another; let the firſt pot ſtand in the hot embers, up to the top, or in a furnace, and the other by a fire to keep warm, and to fill up the firſt pot as it boils away; into the firſt put red briſca, or Spaniſh flocks, or wool, two lb. let it boil till it is thick, adding alum, and a little gum Arabic, of each the quantity of a walnut; diminiſh the heat, and let it be only ſcalding hot; then put in it the matter you would dye, letting it lie twenty-four hours in the liquor.

An excellent obſervation. The Bow dyers know, that the ſolution of jupiter, which is delved in tin, being put in a kettle, to the alum and tartar, makes the cloth, &c. attract the colour into it, ſo that none of the cochineal is left, but is all drawn out of the water into the cloth.

Another obſervation. The ſpirit of nitre, being uſed with alum and tartar, in the firſt boiling, makes a firm ground, ſo that they ſhall not ſpoil nor loſe their colour by the ſun, fire, air, vinegar, wine, urine, or ſalt-water, &c.

Gloralamo da CARPI, born in the year 1501, ſcholar of Rennenuto Gorofalo, ſtudied under Correggio, lived at Bologna, Modena, Ferrara, Rome, &c. excelled in hiſtory and architecture, died in the year 1556, aged fifty-five years.

Ugo da CARPI; he found out the art of printing in chiaro obſcuro,

curo, with two plates of box, then with three, like drawings.

CARTON } a deſign, drawn on ſtrong paper, to be after-
CARTOON } wards calked through, and transferred on the freſh plaiſter of a wall to be painted in freſco.

CARTOON is alſo uſed for a deſign coloured for working in moſaic, tapeſtry, &c. The Cartoons, preſerved at Hampton-Court, are deſigns of Raphael Urbin, intended for tapeſtry.

Jacobo CARUCI *da Puntorm*, born in the year 1493, ſcholar of Lionardo da Vinci, Marietto Albertinelli, P. di Coſimo, and Andrea del Sarta, lived at Florence; excelled in hiſtory and portraits. died in the year 1556, aged ſixty-three.

CARYATIDES, } a kind of order of columns or pilaſters in
CARIATES, } architecture, under the figures of women dreſſed in long robes.

Giorgio del CASTEL FRANCO, called *Gloroione*, born in the year 1477, ſcholar of Gio. Bellini, and ſtudied Lionardo da Vinci; lived at Venice, excelled in hiſtory, painting, and portraits; died in the year 1511, aged thirty-four years.

Bor Tin The firſt of theſe marks is of Bernardo CASTELLI, a Genoeſe painter and inventor: The ſecond is of Camillo Congio, an engraver, whoſe mark was alſo CC *Fecit*.

G *Gio Benedetto* CASTIGLIONE of Genoa, a famous painter and engraver of all ſubjects, uſed this mark.

Benedetto CASTIGLIONE, a Genoeſe, the ſcholar of Batt. Paggi, inſtructed by Van Dyke, rambled in Italy, excelled in hiſtory, landſcapes, and animals.

Of CASTING *figures in plaiſter*. Beſides what is ſaid of making a cavity for caſting in wax, ſee WAX (ſee the articles FOUNDERY and STATUES) it will be no hard matter to conceive how figures are made of plaiſter; for, it being eaſily tempered, and running as eaſily, it is poured into the mould, and ſometimes the figures are taken out all in one piece, eſpecially when the founder is maſter of his buſineſs, and well experienced in it.

All the art is to chuſe good plaiſter in ſtone, that there may be no coal among it; it ought to be well burnt, well pounded, very white, and ſifted through a fine ſieve; however, if it is a great figure, it is moulded at ſeveral times, and even ſeveral parts of the figure, in each piece of the cavity, are half filled before they are ſet together, that they may hold the better, and the better form all the parts.

We ſee, by what Pliny writes, that the cuſtom of making moulds of plaiſter is very ancient; and that it was made uſe of

about earthen figures and plaiſter figures, a long time before it was known how to caſt in metal.

CASTING *figures in lead.* There are not ſo many precautions neceſſary when figures are caſt in lead, as when they are done in braſs; becauſe lead is not ſo ſtrong. See STATUES.

The workman only fills the cavities with earth well managed, of what thickneſs he pleaſes; then he fills all the mould with plaiſter or tile-duſt, with which the ſoul is made.

When the ſoul is finiſhed, all the pieces of the mould are taken aſunder, to take off the earth; and then, being cloſed again, are put about the ſoul, but at four or five inches diſtance.

That interval is filled with coal from top to bottom; all the gaps between the pieces of the mould are filled with brick, and, the coal being ſet fire to, it is all lighted. This is to ſeethe the ſoul, and dry the plaiſter mould which the earth had wetted.

When all the coal has been well lighted, and after it is gone out of itſelf, the workman takes a pair of bellows, and blows off the aſhes that may have got into the pieces of the mould; then thoſe pieces are joined together again as before about the mould; all the chapes are well tied with cords, and covered with plaiſter; after which, the melted lead is poured into the mould, which lead fills the ſpace which was taken up by the earth; nor is it neceſſary to earth the mould, as in caſting in braſs, unleſs it is for great figures.

CF *Francis* CAVEAU, who engraved a great many plates, uſed this mark.

Frederico CASAUBON, alias KERSEBOOM, was born at Solingen, a city of Germany, in the year 1623. At eighteen years of age, he went to Amſterdam, to be inſtructed in the art of painting; to Paris in 1650, and worked ſome years under Monſieur le Brun; but afterwards was ſent to Italy by the chancellor of France, and maintained there, by that miniſter, for fourteen years, two whereof he ſpent with Nicholas Pouſſin, of whoſe manner he was ſo nice an imitator, that ſome of his pieces were taken for his. Thus qualified for hiſtory-painting, he came to England; but, not finding encouragement that way, he bent his ſtudies towards portraits, wherein he was not unſucceſsful, either as to drawing or likeneſs. He was the firſt who brought over the manner of painting on glaſs (not with a print, as the common way now is) in which he performed ſome hiſtories and heads exceedingly well. Perſpective he underſtood thoroughly, having been diſciple to two excellent maſters in that art; and was, in ſhort, an accompliſhed painter. He died in London in the year 1690, and lies buried in St. Andrew's Holborn.

C. C. *Fecit.* ſtands ſometimes for Camillus Congius, and

ometimes for Charles Cignali of Bologna, painter, inv. He uſed lſo two C's, the one within the other.

C. D. F. ſignifies Charles David fecit.

CELERITY, is repreſented, in painting, by a woman, with thunderbolt in her right hand, a dolphin by her ſide, and a hawk flying in the air.

The moral is obvious; all thoſe things being naturally very quick in their motion, which well expreſſeth Celerity.

CEMENTS, *as to melt cryſtal for a ſtrong* CEMENT. Pound cryſtal, and put it into an iron ladle; cover it and lute it well, nd heat it on the fire till it is red-hot, which quench in oil of artar; this do ſo often, till they will be eaſily reduced to powder in a mortar, which will then eaſily melt.

This is of uſe to make a ſtrong cement, and to counterfeit ewels with.

To make a CEMENT *for broken glaſſes.*

1. Mix glair of eggs with quick-lime; and this cement will oin broken pieces of glaſs together, and all earthen pots, ſo that hey will never break in the ſame place again.

2. Or thus, Take old liquid varniſh, and join the pieces with it; tie them together, and dry them well in the ſun, or in an oven, and they will never unglue again; but you muſt not put hot liquor into them.

3. Take white lead, red lead, quick-lime, and gum ſandarac, of each half an ounce, and mix all theſe with the glair of four eggs.

4. Take quick-lime powdered, liquid varniſh, and glair of eggs, of each a like quantity; grind them upon a ſtone; this will be a ſtrong cement even for ſtones. Or,

5. Take white lead, bole, and liquid varniſh as much as ſufficeth. Or,

6. Take fine powder of glaſs, quick-lime, and liquid varniſh, of each a ſufficient quantity.

7. Take calcined flints and egg-ſhells, of each a like quantity, and, with whites of eggs and gum tragacanth, or diſſolution of gum ſandarac, make a cement. This in a few days will be as hard as a ſtone.

8. Take of calcined flints two pounds, quick-lime four pounds, as much linſeed oil as may temper the mixture; this is a very ſtrong cement, but with liquid varniſh would be ſtronger.

9. Take fiſh glue, and beat it thin; then ſoak it in water till it is like a paſte; make rolls of it, which draw out thin, and, when you uſe it, diſſolve it in fair water over the fire, letting it ſeethe a-while, keeping ſcumming of it, and uſe it while it is hot.

CERUSS, a preparation of lead, commonly called white lead, and, by the chymiſts, calx of lead.

Ceruſs

Ceruſs is made of very thin laminæ or plates of lead, ſo laid as to receive and imbibe the fumes of vinegar, placed in a veſſel over a moderate fire.

The laminæ or plates are, by means hereof, converted into a white ruſt, which is gathered together, and, being ground up with water, is formed into little cakes.

Ceruſs makes a beautiful white colour, and is much uſed by painters both in oil and water colours.

The beſt Ceruſs is that of Venice, but this is rare; that which is chiefly uſed, is either Engliſh or Dutch, both of which have more marl in them than white lead; the latter however is the better of the two.

CHALCEDONY, a precious ſtone, of which there are four ſpecies; 1. a bluiſh-white one; this is the moſt common of all, and is found in the ſhape of our flints and pebbles, in maſſes of two, three, or more inches diameter: It is of a whitiſh colour, with a faint cloud of blue diffuſed all over it, but always in the greateſt degree near the ſurface; this is little leſs hard than the oriental onyx. The oriental Chalcedonies are the only ones of any value; they are found in vaſt abundance on the ſhores of rivers in all parts of the Eaſt-Indies, and frequently come over among the ballaſt of the Eaſt-India ſhips: They are common in Sileſia and Bohemia, and other parts of Europe alſo, but with us are leſs hard, more opaque, and of very little value. 2. The ſecond ſpecies is the dull milky-veined Chalcedony: This is a ſtone of little value, and is ſometimes met with among our lapidaries, who miſtake it for a kind of nephritic ſtone; it is of a ſomewhat yelloviſh-white, or cream colour, with a few milk-white veins: This is principally found in New Spain. 3. The third ſpecies is a browniſh-black dull and cloudy one, known to the ancients by the name of the ſmoaky jaſper, or jaſpis capnitis: This is the leaſt beautiful ſtone of all this claſs; it is of a pale browniſh-white, clouded all over with a blackiſh miſt, as the common Chalcedony is with a blue; it is common both in the Eaſt and Weſt Indies, and in Germany, but is very little valued, and ſeldom worked into any thing better than handles of knives. 4. The fourth and laſt ſpecies is the yellow and red Chalcedony: This is greatly ſuperior to all the reſt in beauty, and is in great repute in Italy, though very little known with us; it is naturally compoſed of an admixture of red and yellow, only on a clouded cryſtalline baſis, but is ſometimes found blended with the matter of the common Chalcedony: This is found only in the Eaſt-Indies, and there not plentifully. The Italians make it into beads, and both they and the Germans call theſe caſſidonies; but they are not determine in the uſe of the word, but call beads of ſeveral agates by the ſame name.

To

To make a CHALCEDONY *in glaſs.* There are three different ways to prepare an artificial Chalcedony, which will make three different ſpecies of it, all of them very fair, but whoſe beauty alſo may be augmented by the number of ingredients they are compoſed of; and which cauſe thoſe diverſities of colours, which that ſtone ought to have.

Among the reſt of the ingredients employed for this purpoſe, there are ſome that give no colour to glaſs, as tartar, ſoot, armoniac, and mercury.

Thoſe that are of an uncommon nature, as lead, ſoot, tartar, and the azure ſtone, often hinder the union of the ingredients, by reaſon of the ſeparation which may happen by the cooling the metal, which does not happen to thoſe who know how to obſerve the degree of heat, wherein the principal knowledge of this art conſiſts.

To make the firſt ſort of CHALCEDONY. Put a pound of aqua-fortis prepared into a glaſs body with a long ſtick, and two ounces of ſilver in ſmall and thin plates, or granulated; put the body in an aſh furnace, over a ſoft fire, or in warm water, and the ſilver will be preſently diſſolved.

At the ſame time, take another body and diſſolve in it three ounces of quickſilver, in twelve ounces of the ſame aqua-fortis; then mix both the ſolutions together into a larger body, which ſet into the ſame bath of warm water, or aſh furnace; then add to it three ounces of ſal armoniac, which diſſolve over a gentle fire; then add to it half an ounce of zaffer, and a quarter of an ounce of manganeſe prepared, by little and little, with as much feretto of Spain, alſo by little and little, for fear the matter, coming to ſwell too much, ſhould break the veſſel.

Add to all theſe ingredients half an ounce of crocus martis calcined with ſulphur, as much ſcales of copper three times calcined, which ought to boil like manganeſe; as much blue lake (ſuch as is uſed by painters) and the ſame quantity of red lead, the whole reduced to powder.

In putting in theſe powders, you muſt gently ſtir the glaſs body, that they may the better incorporate with the aqua-fortis, but be ſure to take care that there be not too much heat; then ſtop the matraſs, or glaſs body, very well, ſtirring it well every day, for ten days, that the powders may well incorporate, and that they may always appear as ſeparated from the water.

Set the large glaſs body into a ſand furnace, in a temperate heat, or rather empty it into a glaſs cucurbit, after you have well luted it at the bottom, and ſet it over the ſame fire, ſo that the aqua-fortis may evaporate in twenty-four hours; and at the bottom of the veſſel you will have a yellow powder, which keep ſafely in glaſſes for uſe.

When

When you are to make the Chalcedony, take white cryſtalline glaſs well purified, and that has been often melted; for cryſtal new made is not fit for that operation, becauſe the colours will not ſtick to it, but are conſumed by the frit.

Put about ten pounds of this cryſtalline glaſs into a pot, and, when it is well melted, put in about an ounce and an half of your yellow powder, at three different times; mix the glaſs well with it each time, that the powder may incorporate with it; the glaſs being thus well mixed, let it ſtand an hour; then mix it once more, and let it ſtand for twenty-four hours; then mix it again for the laſt time, and make an eſſay of it; it will give a yelloviſh azure colour.

Having made your eſſay, and found your matter right, the pot may be taken out of the furnace, and, when it is cold, you will have the colours, which ſhall repreſent the wavings of the ſea, and other fine things.

But, to have a very fair Chalcedony, you muſt perform a ſecond operation to join to the firſt, by taking four ounces of tartar calcined, one ounce of chimney-ſoot well purified, a quarter of an ounce of crocus martis calcined with ſulphur; mix the whole together; then put it into the melted metal at five or ſix different times, otherwiſe the impetuous ſwelling of the metals would break the pot, and the whole would be loſt; which may be avoided by putting it in by little and little, ſtirring it each time well, that the matters may incorporate; alſo make the pot boil, and let it ſtand twenty-four hours; after which time you may work it into what you pleaſe.

Which ſet into the furnace to whiten, and ſee if the glaſs pleaſe you; if it be green without, and blue, white, red, yellow, and of all other colours, like jaſper and oriental agate.

If, looking on it obliquely, it be red like fire; and, held to the ſun, it ſhews the colours of the rainbow by reflection of the rays; if ſo, then it is fit to make all ſorts of veſſels, which may be poliſhed at the wheel.

If it be pale and clear, more calcined tartar and ſoot muſt be added to it, as before, ſtirring it well to make it incorporate; then let the glaſs ſtand and purify ſeveral hours, and then you may work it as you pleaſe.

Chalcedony is much uſed for the effigies of kings and princes; for heads, cups, and many other veſſels; principally for ſeals, becauſe it is eaſily engraven, and the wax will not ſtick to it.

A ſecond ſpecies of CHALCEDONY, *finer than the former.*

1. Put a pound of aqua-fortis, and three ounces of coppelled ſilver, granulated into a glaſs body, in order that it may be the better diſſolved.

2. Put alſo a pound of aqua-fortis, and five ounces of mercury well

well purified and paſſed through a glove into another glaſs body, and cloſe it well.

3. Put alſo a pound of aqua-fortis, with two ounces of ſal armoniac, into another glaſs veſſel to be diſſolved.

When it is diſſolved, add to it crocus martis, prepared ſeretto of Spain, leaves of copper calcined, by means of ſulphur, of each half an ounce; reduce the whole into powder, putting them in one after the other, and by little and little, for fear the matter ſhould break the veſſel.

4. Put one pound of aqua-fortis, with two ounces of ſal armoniac, into another earthen body, and, when the whole is diſſolved, add ſucceſſively, as before, of good crude antimony, of blue enamel, ſuch as is uſed by painters, of red lead, and of vitriol well purified, each half an ounce, all of them well pulveriſed; theſe alſo muſt be put in by little and little, as before, for fear of breaking the veſſel; then cloſe it well.

5. Put alſo one pound of aqua-fortis and two ounces of ſal armoniac into another glaſs body, and when diſſolved add two ounces of zaffer prepared, a quarter of an ounce of manganeſe of Piedmont alſo prepared, half an ounce of thrice calcined copper, and an ounce of cinnabar; reduce all to a fine powder, and put them in by little and little into the veſſel, taking care that the powders do not by too much ſwelling break the veſſel; then cloſe it well.

6. Put a pound of aqua-fortis, and two ounces of ſal armoniac, into a ſixth veſſel of the ſame bigneſs as the reſt, and, as ſoon as it is diſſolved, caſt in two ounces of ceruſs by little and little, for that will alſo cauſe a fermentation. Then add the like weight of painters red lake, and as much of iron ſcales from the anvil, putting it in by little and little, for the reaſons beforementioned; and in a word proceed very ſlowly in all theſe operations, ſtopping all the veſſels well.

Set all theſe veſſels on a gentle fire of aſhes, or in a warm bath, to haſten the ſolution of the materials; they muſt be ſtirred at leaſt ſix times a day, for twelve days, in which they muſt continue in that heat, that the aqua-fortis may the better penetrate the powders, and they communicate their tinctures the better to the glaſs. The twelve days being ended, put the whole into a large glaſs crucible, and lute it well for fear of breaking, pouring them gently in out of the ſix matraſſes, one after the other, having firſt well ſtirred each of them; then ſet this cucurbit on a gentle aſh fire, and, having fitted a head and receiver to it, and luted the joints well, then gently diſtil all the aqua-fortis that is in the body, for the ſpace of twenty-four hours, making a very gentle fire towards the end, otherwiſe the powders may be ſpoiled by too much heat, and the ſpirits, which ought to remain in the powder, would paſs into the receiver.

Then

Then they will remain at the bottom of the veſſel of a yellowiſh-red colour, which keep in a glaſs well ſtopped for tinging glaſs or cryſtal, which is yet better.

The third and laſt way of making CHALCEDONY. This, tho' ſomething more tedious, ſurpaſſes the two other in beauty.

1. To make this preparation: Take the aqua-fortis, of which put one pound into a glaſs matraſs, with four ounces of leaf ſilver to diſſolve; then ſtop the matraſs.

2. Put a pound of the ſame aqua-fortis, with five ounces of mercury purified with ſalt and vinegar, after the following manner:

Put common ſalt into a wooden diſh, ſprinkle it with vinegar, and add to it a little common fair water to make it diſſolve; put in the mercury, and ſtir it well with a wooden peſtle to draw out the blackneſs; repeat the waſhing them often with ſalt and vinegar, till there be no more blackneſs; then dry them with warm linen or cotton, and paſs it through a glove; then it will be purified and fit to put into the aqua-fortis. When it is diſſolved, ſtop the matraſs and keep it.

3. Take another glaſs body, put into it another pound of aqua-fortis, with three ounces of fine ſilver calcined.

Amalgamate the ſilver with the mercury, as the goldſmiths uſually do, and put it into a crucible, with its weight of common ſalt purified.

Then ſet the crucible on hot coals, that the mercury may evaporate, and that only the ſilver may remain at the bottom, which will be purified and calcined.

Then add to that calcined ſilver an equal weight of common ſalt, purified as before; mix them well together, and ſet them over the fire in a crucible to calcine them again; then waſh them well with warm water to take out the ſalt, and afterwards put this ſilver into a glaſs phial filled with common water; boil it, till one fourth of it is conſumed, then let it cool and ſettle to the bottom; after that decant off the water, and put more upon it.

Repeat this proceſs with freſh water three times, and, at the fourth, dry the ſilver, put it into the aqua fortis, and ſtir it well and ſtop the matraſs.

The method of purifying common ſalt is as follows: Diſſolve ſea-ſalt in a convenient quantity of common water, boiling it for the ſpace of two hours; then let the water reſt, that the earthy part of the ſalt may ſettle to the bottom; then filtre the water and evaporate it in an earthen veſſel, or rather in a glaſs cucurbit, till the ſalt remain dry at the bottom.

Diſſolve this ſalt again, making the water boil; then let it ſtand for the dregs to ſettle, after which filtre it and evaporate it as before; which you muſt continue to do, till there are no

more fæces or dregs, and it will be well purified and prepared.

In order to continue the preparation of the materials,

4. Put a parcel of aqua-fortis into a glaſs matraſs, and add three ounces of purified ſal armoniac, that is to ſay, filtred and whitened, till it leave no fæces or dregs, as has been ſhewn in common ſalt; then diſſolve a quarter of an ounce of ſilver in that water, and ſtop the veſſel well.

5. Put alſo another pound of aqua-fortis into another glaſs matraſs, with three ounces of purified ſal armoniac, that is to ſay, filtred and whitened till it leave no fæces or dregs, as has been ſhewn as to common ſalt; then diſſolve a quarter of an ounce of ſilver in that water, and ſtop the veſſel well.

6. Put alſo another pound of aqua-fortis into another glaſs matraſs, with two ounces of ſal armoniac; when it is diſſolved, put into that water cinnabar and crocus martis calcined with ſulphur as above; of ultramarine and feretto of Spain prepared, of each half an ounce, having reduced all to a fine powder; this muſt be put in by little and little, for fear of breaking the veſſel by the fermentation which they make with the aqua-fortis; then ſtop the matraſs.

7. Put a pound of aqua-fortis into another matraſs, and diſſolve it in two ounces of ſal armoniac as before; add to it of crocus martis calcined with calcined tin, known among the glaſs-men; of zaffer deſcribed and cinnabar, each half an ounce; powdering them all very well, putting them in by little and little, as before; then ſtop the matraſs.

8. Put alſo another pound of aqua-fortis into another matraſs, and diſſolve in it two ounces of ſal armoniac; then add an ounce of ſmall leaves of copper calcined, half an ounce of ſcales of copper thrice calcined, half an ounce of manganeſe of Piedmont prepared, and half an ounce of ſcales of iron, which fall from the ſmith's anvil, the whole being reduced to a fine powder; which throw in by little and little as before, then ſtop it well.

9. Put another pound of aqua-fortis into another glaſs body, and add to it two ounces of ſal armoniac; the diſſolution being made, put to it half an ounce of red lead, by little and little, and one ounce of ſcales of copper, half an ounce of crude antimony, and as much caput mortuum of vitriol purified, all being reduced to a fine powder; then ſtop the matraſs.

10. Put another pound of aqua-fortis into another glaſs matraſs, with two ounces of ſal armoniac; add to this water orpiment, white arſenic, and painters lake of each half an ounce; let the whole be finely powdered, put them into a matraſs by little and little as before, and ſtop it up well.

It has not been repeated at each operation, that you muſt ſet your matraſs on an aſh furnace over a gentle heat, or in a warm bath,

bath, to haſten the ſolution of the materials; becauſe it has been ſaid, that it muſt be always done in the preparation of these things, which are for tinging the firſt ſpecies of Chalcedony.

All the nine matraſſes, mentioned in this proceſs, muſt remain fifteen days in the ſame heat, and be often ſtirred daily, that the water may the better operate on the materials, ſubtiliſing them, and well opening their tinctures.

Then put all theſe materials, with the aqua-fortis, into a large glaſs body, by little and little, that they may unite well together; cloſe the body, and ſet it on the ſame heat, ſtirring it well for ſix days.

After this, take a large glaſs cucurbit, well luted half-way up the body of it, and ſet it on an aſh furnace; put into it all the materials out of the body; fit a head and receiver to it, lute the joints well, and diſtil it for twenty-four hours over a gentle fire, leſt the colours ſhould be ſpoiled, that the water may paſs gently over, and the ſpirits remain in the powder; which of green will become yellow.

Thus putting that powder in the requiſite doſe, as has been taught in the firſt ſpecies of Chalcedony, into purified metal made of broken pieces of cryſtal, and not of frit; and adding to it in its due time calcined tartar, chimney ſoot, crocus martis made with vinegar, as has been directed; and theſe materials will give an opacity to glaſs, which in twenty-four hours time may be wrought, managing it well with proper tools and often beating it; and you will have things of an extraordinary beauty, greater than can be imagined.

CHARGE, } [in painting] is an exaggerated re-
OVER-CHARGE, } preſentation of any perſon, wherein the likeneſs is preſerved, but withal ridiculed.

Few painters have the genius to ſucceed in theſe Charges; the method is to pick out and heighten ſomething already amiſs in the face, whether by way of defect or redundancy; thus, v. g. if nature has given a man a noſe a little larger than ordinary, the painter falls in with her, and makes the noſe extravagantly long; or, if the noſe be naturally too ſhort, in the painting he makes it a mere ſtump, and the like of the other parts.

CHARITY, is repreſented in painting, &c. by a woman all in red, a flame on the crown of her head, with an infant ſuckling on her left arm, and two others ſtanding up, one of which is embraced with the right.

The red colour denotes Charity; the flame ſignifies that Charity is never idle, but always active; the three children ſhew the triple power of Charity, for Faith and Hope, without her, ſignify nothing.

CHASTISEMENT, is repreſented in painting, &c. by a ſevere

ſevere furious fellow, with an ax in one hand, as much as to ſay he will give but one blow; and a lion by him, worrying a bear.

CHARON, Pluto's ferriman, who carries ſouls over the three rivers of hell, Acheron, Cocytus, and Styx, is deſcribed old, yet exceeding robuſt and ſtrong, cloathed with a black mantle, hanging looſely over his ſhoulders; and alſo ſometimes with long curled black hair, and clad in a robe of cloth of gold. By Charon is ſignified time, and, by his being ſuppoſed to have the tranſportation of ſouls from one ſide of thoſe rivers to the other, is intimated, that, as ſoon as we are born into the world, it carries us along by little and little unto our deaths; and ſo tranſports us over thoſe rivers, whoſe names, by interpretation, ſignify ſorrowfulneſs, for we paſs this life in miſery and adverſity.

CHASTITY, is repreſented in painting, &c. by a modeſt, honeſt-faced woman, holding a whip in one hand, as if ſhe would correct herſelf, cloathed with a white robe; on her girdle is written caſtigo corpus meum, I chaſtiſe my body. At her feet Cupid lies conquered, with his bow broken and he blinded.

The whip denotes chaſtiſement; the Cupid, with his bow broken, that no concupiſcence has dominion over her.

CHINA *Ware.* See PORCELANE.

The imitation of CHINA *or porcelane ware upon tea-tables, tea-boards, &c. upon gold and ſilver grounds.* After the tables or other utenſils have been prepared as directed in JAPAN, mark out the deſigns upon them, make ovals or rounds upon them in a good diſpoſition, ſo as to be uniform, or well adapted to the deſign, that they may anſwer one another in a regular manner; then paſte on ſome paper in proper places, and, when the paper is dry, draw your deſigns upon them, and paint them with water colours; then, with a bruſh, lay gold or ſilver ſize, and, when it is near dry, lay on leaf-gold or ſilver; and, when all is dried, varniſh over, with the ſtrongeſt varniſh, except only the ovals or circles of painting, for thoſe muſt be done with the white varniſh, which is ſo tranſparent, that all the painting will appear through it.

If you lay on a gold ground, or any colour darker than that, then let your painting be blue and white; or, if it is ſilver or light ground, then uſe the moſt fiery colours in your paintings.

To take off the figure from any piece of CHINA *Ware, though the perſon has not been acquainted with drawing.* If there be upon a diſh, plate, cup, &c. any figures that you like, and would take off, you muſt lay a piece of oiled paper over them, ſo as to hold the piece ſteady till you can trace out the lines of the figures; then lay the oily paper on a paper blacked on one ſide, and the

blacked paper on a clean paper; then trace the lines with a pen or blunted point of a needle, till the lines are all impreſſed on the white paper, and draw them over with a black-lined pencil, and mark the ſhades where they ſeparate from the light parts of the colour, that ſo you may lay on your colours as you ſee them painted on the China ware; then cut out the figures cloſe to the outlines, and fix them upon your ground of whiting and ſize, or ſize with ground chalk, with thick gum arabic and water; and, when they are quite dry, paint them, the lighter parts in water colour, and the ſhady parts with varniſh mixed with the darker colours; when theſe are dry, waſh all over with the white varniſh before the fire, but take care that it be not ſo nigh the fire as to make the varniſh riſe in bliſters.

When the varniſh is dry, lacker it again with the ſame varniſh, and repeat this a third time; then ſcrape ſome tripoli very fine, and, with a ſoft rag dipped in water, take up a little of the tripoli at a time, and poliſh it by gentle rubbing till it is ſmooth; then waſh off the tripoli with a ſoft ſpunge and water, and then wipe it off with a dry fine cloth; and, when it is thoroughly dry, if it be a white varniſh, clean it with whiting and oil; and, if a black varniſh, with lamp-black and oil.

But the common way is to cut out prints, and paſte them on ſuch parts as is thought fit, and then to colour them with water colours, and to varniſh them with white varniſh.

This is an eaſy way of painting, becauſe the ſhades of the prints, when you lay on a tranſparent water colour, will give the light and ſhade that colour to your purpoſe, without uſing a dark and light colour.

CHOLER, is repreſented, in painting, by a meagre youth of a ſallow colour, with a haughty look, being almoſt naked; holding a drawn ſword in his right-hand; on one ſide a ſhield with a flame in the middle, and a fierce lion on the other ſide.

Lean, becauſe heat predominates, which the ſhield denotes; his yellow colour ſhews his Choler; the drawn ſword his haſtineſs to fight; his nakedneſs and his impetuous paſſion does not ſuffer him to provide for himſelf: The lion his animoſity.

CHOROGRAPHY, is repreſented in painting, &c. by a young lady in a changeable-coloured habit, plain and ſhort; in her right-hand a meaſuring ſquare, a globe on the ground, with a little part deſigned; in her left, compaſſes.

The changeable habit denotes the different taking of ſituations; her ſhortneſs ſignifies the taking plans of dominions more briefly, when they take the leaſt part for the greateſt; the inſtrument, the taking by it the limits of every dominion; the compaſſes denote the ſetting them to diſtinguiſh the confines from one another.

CHROMATIC, in painting, a term uſed to ſignify the colouring, which makes the third part of the art of painting.

CHRYSOLITE, the name given by the moderns to a gem, which was called the topaz by the ancients; all the modern jewellers, and thoſe of ſeveral ages before them, have agreed in calling this gem the Chryſolite; and the true Chryſolite of the ancients, which had its name from its fine gold yellow colour, they now univerſally call the topaz.

The Chryſolite of our times, the topaz of the ancients, is, even in its moſt pure and perfect ſtate, a gem of but ſmall beauty, and of no great value. It it found of various ſizes, and ſome of the coarſer pieces of it are vaſtly larger than any of the other gems are ever found to be; its moſt frequent ſize, however, when perfect, is about the bigneſs of a nutmeg. It is found of very various figures, but never columnar, or in the form of cryſtal; it is in ſome places found ſmall, and in roundiſh or irregular pebble like maſſes; and, in others, generally oblong and flatted, and is always of a rude ſurface and leſs bright than any other of the native gems. Its colour is a dead green with a faint admixture of a pale yellow; it has three different tinges in the ſeveral ſpecimens in different degrees of mixture; but its moſt uſual colour is that of an unripe olive, with ſomewhat of a braſſy colour mixed with it; and ſometimes is a pale and duſky green obſcured by a mixture of brown, and with a ſlight caſt of the ſame braſſy yellow. It is much ſofter than any of the pellucid gems; its fineſt pieces do not excel cryſtal in hardneſs, and its coarſer are greatly ſofter; it takes a good poliſh however, and in ſome of its finer ſpecimens makes a tolerable figure, though greatly inferior to the other gems. Our jewellers take very little notice of it, and inſtead of having two or three names for it, as they have for moſt other of the gems, they call it very often a praſius, and the leſs accurate among them often call the chryſopraſius a Chryſolite.

The Chryſolite is found in New Spain, and in ſeveral parts of Europe, as Sileſia, Bohemia, &c. The American, however, are greatly ſuperior to the European, but are uſually ſmall; the Bohemian are large, but very few of them are of a good colour, or free from flaws.

To make a paſte for an oriental CHRYSOLITE. To imitate this ſtone, take two ounces of natural cryſtal prepared, eight ounces of minium in fine powder, add to it twelve grains of crocus martis made with vinegar, mixing the whole well together.

Then put the whole into a crucible, and ſet it in a furnace, leaving it there a little longer, that it may have time to purify from the lead.

Then will you have a paſte for the oriental Chryſolite, which will appear very admirable, ſet with a foil in gold.

The way to make CHRYSOLITE. Take ten ounces of our powder of natural cryſtal, and ſaturnus glorificatus (which ſee) to which add one ounce of crocus martis prepared; the whole reduced to fine powder, well mixed, and put into a crucible covered and luted, and bake it as directed for other of the like metals, and you will have a fine Chryſolite colour, which will be of the native green.

Lodovico CIGOLI or CIVOLI, born in the year 1559, ſtudied Andrea del Sarto and Correggio; lived at Florence and Rome, excelled in hiſtory, died in 1613, aged fifty-four years.

Giovanni CIMABUE, of noble deſcent, the father of the firſt age or infancy of modern painting, a diſciple of certain ordinary Greek painters brought to Florence, born in the year 1240, where he lived, excelled in hiſtory and architecture, died in the year 1300, aged ſixty years.—He was of the family of the Cimabue, in thoſe days reputed noble; and, being a promiſing child, was ſent to ſchool to the monaſtery of Santa Maria Novella. But, inſtead of minding his book, he ſpent all his time in drawing of men, horſes, and the like, upon paper, or the backſide of his books.—Much about this time, thoſe who governed in Florence, invited ſome painters out of Greece, that the art of painting which was totally loſt by the deluge of calamities, which for ſeveral hundred years had overwhelmed Italy, and had ruined all the public fabrics, and the product of the induſtry of the ancients, might be reſtored among the Italians.—There Cimabue, following his ſecret inclination, uſed to get from ſchool, and paſs the whole day with thoſe painters to ſee them work. So that, at laſt, his father, perceiving how fond he was of that art, agreed with the Greek painters to take him under their care, which they the more readily did, judging he was very likely to ſucceed in his profeſſion. Accordingly, in a ſhort time, he ſurpaſſed his maſters, both in deſign and colouring, for they, not at all attentive to improve their art, had contented themſelves with a plain flat manner, as may be ſeen in thoſe of their works that have been preſerved to our time; but Cimabue, though he imitated them, yet he had a much freer way, as appears by his works that remain.

CINNABAR, a mineral ſtone, red, heavy, and brilliant, found chiefly in the quickſilver mines; called alſo vermilion.

The ordinary vermilion is nothing elſe but Cinnabar ground up with ſpirit of wine and urine.

Cinnabar is either native or factitious.

The native or mineral Cinnabar, or vermilion, which is that abovementioned, is found in moſt places where there are quickſilver mines; yet it is true alſo, that it has mines of its own

those in Spain are very famous; the French also have some of them in Normandy.

It may be esteemed as marcasite of quicksilver, or rather, as quicksilver petrified and fixed, by means of sulphur and a subterraneous heat. Chemistry being found to reduce it without much trouble or loss to the nature of mercury, each pound of Cinnabar yields fourteen ounces of mercury.

Accordingly, the principal property and use of this mineral is to yield a most excellent mercury.

The best mineral Cinnabar is of a high colour, brilliant, and free from the stone.

Factitious or artificial Cinnabar, or vermilion, is formed of a mixture of mercury and sulphur sublimed, and thus reduced into a kind of stone.

The best is of a high colour, full of fibres, like needles.

The method of preparing factitious CINNABAR. They take six ounces of sulphur, and eight of quicksilver; they mix them well, then set them on the fire till part of the sulphur is consumed, and the powder remains black.

After this, it is sublimed once or twice in open pots, at the bottom of which the Cinnabar remains, very heavy, and streaked with the lines or needles, some red, other brilliant like silver.

This is used by painters as a colour, it being a very vivid red, but not drying without some difficulty; Cinnabar or vermilion is rendered more beautiful by grinding it with gum water and a little saffron, those two drugs preventing it from growing black.

There is likewise a blue Cinnabar, made by mixing two parts of sulphur with three of quicksilver, and one of sal armoniac; these, being sublimed, produce a beautiful blue substance, whereas quicksilver and sulphur alone produce a red.

To purify CINNABAR *or vermilion.* Cinnabar, being a compound of mercury and sulphur, must be divested of the impurities it contracts from those minerals, which impurities darken its lustre, and cause it to change.

Grind Cinnabar in stone with fair water on a marble or porphyry, put it into a glass or earthen vessel to dry, then put urine to it, and mix it so that it be thoroughly wet, and swim; then let it settle, and, the Cinnabar being precipitated or fallen, pour off the urine by inclination, and put fresh in the room of it, leaving it so all night, and repeating the same change for four or five days, till the Cinnabar be thoroughly purified.

Continue the process with beating up the white of an egg, which mixing with fair water, pour it upon the Cinnabar, and stir the whole about with a walnut-tree stick; change this liquor two or three times as above, and keep the vessel close stopped up, or closely covered for fear of dust, which would spoil the

Cinnabar, and, when you would uſe it, temper it with gum-water; with this it will not change its colour.

Another way. Firſt pulveriſe the Cinnabar, and then grind it on a porphyry with the urine of a child, or with brandy, and dry it in the ſhade.

If you would intirely diveſt it of all its obſcurities, and give it a brighter or redder countenance, infuſe in the brandy a little ſaffron, or put in a little urine, and grind the Cinnabar with this liquor.

Of dying a CINNAMON *Colour.* Take water, a ſufficient quantity; madder, a pound and an half; nut-galls, a pound; fuſtic, a pound; red wood, two ounces; boil all in your cauldron; after, enter twenty yards of cloth and handle it, boiling it ſtrongly two hours; cool it, and put into the liquor copperas, four ounces; enter your cloth again; boil and handle, boil a quarter of an hour, and cool it; then put in copperas, two ounces more; enter your cloth again, and handle it, and let it boil a quarter of an hour, then cool it, and it will be a good Cinnamon colour; the leſs copperas the lighter it will be, the more copperas the deeper. Or,

Take water, a ſufficient quantity; dry rotten oak, half a buſhel; madder, two pounds; boil them well, and enter twenty yards of cloth; which handle well, and boil three hours, ſtill handling it; take it out of the cauldron, and air it; and, if need be, add a little more water to the dye, and put in copperas, twenty-four ounces; enter your cloth again, take it out and cool it, and, if it is not ſad enough, put it in again with more copperas.

CIVET, is a perfume produced by an animal called a Civet cat.

This animal pretty much reſembles our cat, excepting that its ſnout is more pointed, its claws leſs dangerous, and its cry different.

The perfume, produced by this animal, is formed like a kind of greaſe or thick ſcum in a ſort of bag under his tail. This greaſe is gathered from time to time, and ſtill abounds in proportion as the animal is fed.

Before any of theſe animals were ſeen in Europe, or it was known how the perfume was gathered, it was, according to the relations of travellers, ſuppoſed to be the ſweat of that animal irritated and kindled into a rage.

That the method of performing it was by incloſing the animal in an iron cage, and whipping him a great while with rods, then gathering the ſweat or foam of the animal with a ſort of ſpoon, through the iron bars, from between the thighs.

But ſince we have by experience been taught better, and that the

the perfume Civet is only a thick unctuous humour, ſecreted by certain glands, between the two tunics of the bag in which it is amaſſed, under its tail, beneath the anus.

There is much Civet produced in Baſſora, Calicut, and other places, where the animal that produces it is found; though a great part of the Civet we have is furniſhed by the Dutch, who keep and bring up a conſiderable number of Civet cats.

Beſides the Civet from India and Holland, there is alſo from Braſil or Guinea, like that of India, and an occidental Civet, which bears no reſemblance to it.

Civet muſt be choſen new, of a good conſiſtence, a whitiſh colour, and a ſtrong diſagreeable ſmell.

Civet is adulterated by mixing with it the gall of an ox, and ſtorax liquified and waſhed, or by the addition of honey of Crete.

Another way is, by taking the pure pulp of raiſins of the ſun, four ounces; muſk reduced to a fine powder, half an ounce; which being well mixed together, nine ounces of Civet are added and mixed again, and then digeſted in a bolt-head in a ſand-heat, for twenty days; and, when it is cold, it is taken out, ſtirred, and mixed well together, and kept in a jar-glaſs, cloſe covered with bladders.

Another way. Take liquid ſtorax, honey, ox-gall, fine pulp of figs, of each an ounce and a quarter; muſk in fine powder, half an ounce; choice Civet, ten ounces; mix them well in a mortar, put them into a bolt-head, and digeſt them for twenty days, as before.

CLARO-*Obſcuro*, } in painting, is the art of diſtributing to
CLAIR-*Obſcure*, } advantage the lights and ſhadows of a
CHIARO-*Scuro*, } piece, both with regard to the eaſing of the eye and the effect of the whole piece.

Thus when a painter gives his figures a ſtrong relievo, looſens them from the ground, and ſets them free from each other, by the management of lights and ſhadows, he is ſaid to underſtand the Clair-obſcure.

The Claro-obſcuro makes one of the great diviſions, or branches of painting; the whole of a picture being reſolvable into light and ſhadow. See LIGHT and SHADOW.

CLAIR-*Obſcure*, } is alſo uſed to ſignify a deſign, conſiſting
CHIARO-*Scuro*, } only of two colours, moſt uſually black and white, but ſometimes black and yellow; or it is a deſign only waſhed with one colour, the ſhadows being of a duſky brown colour, and the lights heightened up with white.

The word is alſo applied to prints of two colours, taken off at twice; whereof there are volumes in the cabinets of the curious in prints.

The word Clair-obſcure is a compound of two others. Clair

is uſed by the French for thoſe parts of a painting which reflect the moſt light; and comprehends not only the lights themſelves, but alſo thoſe colours that are luminous. By obſcure, is meant not only all the ſhades, but alſo all the colours that are duſky.

CLEARNESS, is repreſented, in painting, &c. by a naked youth of a noble aſpect, ſurrounded with a great ſplendor and brightneſs, with the ſun in his hand.

His youth ſhews him acceptable to every body, and is ſaid to be illuſtrious like the ſun that illuminates every thing in the world.

CLEOPHANTUS of Corinth, made the next improvement upon Ardices of Corinth, who firſt attempted to fill up his outlines. But, as he did it with one ſingle colour laid on everywhere alike, his pieces, and thoſe of Hygiemon, Dinias, and Charmas, his followers, from thence got the name of monochromata, pictures of one colour.

Francis de CLEYN, was a Dutch painter, and maſter of the tapeſtry works to king Charles I. at Mortlack, for which he painted cartoons in diſtemper; he was very eminent for his invention, and made ſeveral deſigns that were extraordinary fine for painters, gravers, ſculptors, &c. amongſt which are cuts of ſome of Ogylby's books. He died at Mortlack a little before the reſtoration.

CLIO, one of the muſes, the patroneſs and inventreſs of hiſtory, is repreſented, in painting, with a coronet of bays; holding in her right hand a trumpet, in her left hand a book, upon which may be written hiſtoria. Her name is derived from praiſe and glory.

MC *Henry de* CLIVEN, or *de* CLEF, painter of Antwerp, uſed this mark; he died anno 1589. So alſo did Martin de Clef.

Cl. Mell. in Sſ. Romæ, ſignifies Claudius Mellanus.

CLOUDS, *Sky, &c.* For colouring them, do as follows:

1. For a beautiful ſky, fitted for fair weather, uſe bice tempered with white, laying it in the upper part of the ſky (as you ſee proper) under which you may lay a thin or faint purple, with a ſmall ſoft bruſh, working the undermoſt purple into the uppermoſt blue, but ſo as that the blue may ſtand clear and perfect.

2. For the horizon, or near the ſame, lay a fine thin maſticot, which work from below upwards, till it mix with the purple; after which, you may take a ſtronger purple, making here and there, upon the former purple, as it were the form of clouds as nature requires.

3. Upon the maſticot, you may alſo work with minium mixed with ceruſs, to imitate the fiery beams, which often appear in hot and clear ſummer weather.

4. To

4. To imitate glory with a great ſhining light of a yellowiſh colour or the ſun-beams, you muſt uſe maſticot or ſaffron mixed with red lead, and heightened with ſhell gold or the like.

5. A cloudy ſky is imitated with pale bice, ſhading the clouds afterwards with a mixture of ſeveral colours; a fair ſky requires clouds of a greater ſhade, with purple.

6. The clouds in a rainy ſky muſt be ſhaded with indigo and lake; in a night ſky, with black and dark blue, ſmoaky, making a blaze with purple, minium, and ceruſs.

7. The clouds, at ſun riſing or ſetting, muſt be made with minium, ceruſs, and purple, making ſcattering ſtrokes underneath the clouds with minium and maſticot, or minium and ſaffron; ſo that the ſcattering upwards may appear faint, and ſomething fiery below afar off, near the landſcape.

8. Make a fiery ſky with pale blue, ſmoothing it downwards, which muſt be afterwards mingled with a ſtrong red lead mixed with ceruſs, making long diminutive ſtrokes like the ſun-beams upon the blue ſky, with which let fall ſome purple ſtrokes, much like the ſaid beams; then ſweeten one into another with a ſoft bruſh-pencil, wet in gum-water, not too ſtrong.

9. Make a fair ſky, by uſing fair bice alone, and tempering it by degrees with more and more white; ſmoothing one into the other from above downwards, and ſhading it as you think proper, and as nature requires.

Of dying CLOVE *Colour*. Take water, a ſufficient quantity; fuſtic, twenty-four ounces; cruſt-madder and nut-galls, of each a pound; red wood ground, four ounces; boil them, and enter twenty yards of broad-cloth; boil it two hours with a ſtrong heat, handling it; then put in copperas, half a pound; oak ſhavings, four ounces; enter your cloth again, handle it well, boil it half an hour, and ſo cool it; if you would have the colour ſadder, put in more copperas. Or,

Take water, a ſufficient quantity; joiners oak ſhavings, four pounds; madder, two pounds; red wood and walnut-tree leaves, of each four ounces; boil them well, and enter twenty yards of cloth, which handle well, and boil it three hours, ſtill handling it; then take it out and air it, adding, if need requires, a little more water; then take copperas, thirty ounces; enter your cloth again, take it out and cool it, and ſadden it, if need requires, with more copperas.

Don Giulo CLOVIO, born in 1498, ſcholar of Giulo Romano, lived at Rome and Hungary; excelled in miniature, hiſtory, and portraits; died in the year 1578, aged eighty years.



Herman COBLENT has put this mark under the four Evangeliſts, and other plates; one of David, of Judith, and Lucretia; and afterwards Adrianus Hubertus uſed this mark with excudit.

COCHI-

COCHINEAL, a drug uſed by dyers in giving red colours, eſpeciallo crimſons and ſcarlets.

Cochineal is an inſect ingendered on a plant having a fruit reſembling a pear; the ſhrub which bears it, is five or ſix feet high. At the top of the fruit grows a red flower, which, when mature, falls on the fruit; and that opening diſcovers a cleft, two or three inches in diameter. The firſt then appears full of little red inſects, having wings of a ſurpriſing ſmallneſs, and which would dye and rot there, if not taken out.

The Indians therefore, ſpreading cloths under the tree, ſhake it with poles, till the inſects are forced to quit their lodging, and fly about the tree; which they cannot do many moments, but tumble down dead into the cloth, where they are left until they be intirely dry. When the inſect flies, it is red; when it is fallen, black; and, when dry, white, though it afterwards changes its colour.

There are whole plantations of the Cochineal tree, or tonna, as the natives call it, about Guatimala, Chepe, and Guexach, in the kingdom of Mexico.

Vivano CODAZZO, called *Viviane*, called *Dalle Proſpettive*, born in the year 1599, ſcholar of Auguſtino Taſſo, lived at Rome, excelled in buildings and ruins, died in the year 1674, aged ſeventy-five years.

Stephen COLBENSTAGH, *ſc. Romæ.* He engraved the paintings of Domenicheno, and uſed this mark.

Adam COLONI, commonly called the *Old*, was a Dutch painter, born in Rotterdam, but who reſided a great while in England, and became eſpecially eminent for his ſmall rural pieces, cattle, country wakes, fire-pieces, &c. he alſo copied many pictures of beaſts after Baſſano, particularly thoſe of the royal collection, which are eſteemed his beſt performances. He died in London in 1685, aged fifty-one years, and lies buried in St. Martin's church.

Henry, alias Adrian COLONI, was the ſon of the foremention-ed; he was inſtructed by his father and brother-in-law, Mr. Van Dieſt, and became a good draughtſman, as a great number of academy pieces, drawn by him, teſtify; he often wrought upon the ſmall figures of his brother Van Dieſt's landſcapes, and they received no ſmall addition of beauty from what he did, eſpecially when he ſtrove to imitate the manner of Salvator Roſa. He died young about the year 1701, at thirty-three years of age, and lies buried in St. Martin's church. He was a perſon of a lively invention, and painted very quick.

COLOUR, is defined to be a property inherent in light, whereby, according to the different ſizes or magnitudes of its parts,

arts, it excites different vibrations in the fibres of the optic erve, which, being propagated to the ſenſorium, affect the mind with different ſenſations.

Or it is defined to be a ſenſation of the ſoul, excited by the pplication of light to the retina of the eye, and different as that ight differs in the degree of its refrangibility, and the magnitude f its component parts.

So that, in the former view, light is the ſubject of Colour, and n the latter it is the agent.

The opinions of authors, both ancient and modern, have been various, with reſpect to the nature and origin of the phænomenon of Colour.

The moſt popular opinion is that of the followers of Ariſtotle, who maintained that Colour was a quality reſiding in the coloured body, and that it does exiſt independently of light.

The Carteſians came indeed ſomething nearer to the truth, who owned, that, as the coloured body is not immediately applied to the organ, to occaſion the ſenſation, and that as no body can affect the ſenſe but by immediate contact; the coloured body does not excite the ſenſation of itſelf, or contribute any thing to it, otherwiſe than by moving ſome interpoſed medium, and by that the organ of light.

They add, that, as we find that bodies do not affect the ſenſe in the dark, light only occaſions the ſenſe of Colour, by moving the organ; and that coloured bodies are no farther concerned, than as they reflect the light with a certain modification; the differences in their colours ariſing from a difference in the texture of their parts, whereby they are diſpoſed to reflect the light with this or that modification.

But it is to the incomparable Sir Iſaac Newton we owe a ſolid and conſiſtent theory of Colours, built on ſome experiments, and ſolving all the phænomena thereof. His doctrine is as follows:

It is found by experience, that rays or beams of light are compoſed of particles very heterogeneous, or diſſimilar to each other, i. e. ſome of them, as it is highly probable, are larger, and others leſs.

For a ray of light, as E F (ſee plate A. fig. 1.) being received on a refracting ſurface, as A D, in a dark place, is not wholly refracted to L, but ſplit as it were, and diffuſed into ſeveral little rays; ſome of which are refracted to L, and others to the other intermediate points between L and G, i. e. thoſe particles of the light, which are the moſt minute, are of all others the moſt eaſily and moſt conſiderably diverted, by the action of the refracting ſurface, out of their rectilinear courſe towards L: And the reſt, as each exceeds another in magnitude, ſo is it with more

more difficulty and leſs conſiderably turned out of its right line to the points between L and G.

Now each ray of light, as it differs from another in its degree of refrangibility, ſo does it differ from it in Colour; this is warranted by numerous experiments.

Thoſe particles, for inſtance, which are moſt refracted, are found to conſtitute a ray of a violet Colour, i. e. in all probability, the moſt minute particles of light, thus ſeparately impelled, excite the ſhorteſt vibrations in the retina, which are thence propagated by the ſolid fibres of the optic nerves into the brain, there to excite the ſenſation of violet colour, as being the moſt duſky and languid of all Colours.

Again, thoſe particles which are the leaſt refracted, conſtitute a radiolus or ray of a red Colour, i. e. the largeſt particles of light excite the longeſt vibrations in the retina, ſo as to produce the ſenſation of a red colour, the brighteſt and moſt vivid of all Colours.

The other particles, being in like manner ſeparated according to their reſpective magnitudes into little rays, excite the intermediate vibrations; and thus occaſion the ſenſation of the intermediate Colours, much in the ſame manner as the ſeveral vibrations of the air, according to their reſpective magnitudes, excite the ſenſation of different ſounds.

To this it may be added, that not only the more diſtinct and notable Colours of red, yellow, blue, &c. have thus their riſe from the different magnitudes and refrangibility of the rays; but alſo the intermediate degrees or tints of the ſame Colour, as of yellow up to green, of red down to yellow, &c.

Further, the Colours of theſe little rays not being any adventitious modifications thereof, but connate, primitive, and neceſſary properties, as conſiſting, in all probability, in the magnitudes of their parts, muſt be perpetual and immutable, i. e. cannot be changed by any future refraction or reflection, or by any modification whatſoever.

This is confirmed by abundance of experiments; all endeavours having been uſed, after ſeparating a coloured ray from thoſe of other kinds, to change it into ſome other Colour by repeated refractions, but to no effect.

Apparent tranſmutations of Colours indeed may be effected, viz. where there is an aſſemblage or mixture of rays of different kinds; the component colours never appearing in their natural hue in ſuch mixtures, but always allayed and tempered with each other; whence reſults a middling kind of Colour, which by refraction may be ſeparated into component ones, and thoſe, after ſeparation being re-mixed, return to their former Colour.

Hence the tranſmutations of Colours, by mixing thoſe of different

erent kinds, are not real, but mere appearances and deceptions of the ſight; for, the rays being again ſevered, exhibit the ſame Colours as at firſt: Thus blue and yellow powders, well mixed, appear, to the naked eye, green; yet, without having paſſed any alteration, when viewed through a microſcope, the blue and yellow particles ſtill appear diſtinct.

Hence there ariſe two kinds of Colours, the one original and ſimple, produced by homogeneal light, or by rays that have the ſame degree of refrangibility, and the ſame magnitude of their parts; ſuch as red, yellow, green, blue, a violet, purple, orange, and indigo, with all their immediate tints and gradations.

The other kind of Colours is ſecondary, or heterogeneous, compounded of the primary ones, or of a mixture of rays differently refrangible, &c.

There may alſo be ſecondary Colours, produced by compoſition, like the primary ones, or thoſe conſiſting of homogeneal light, as to the ſpecies or appearance of the Colour; but not as to the permanency or immutability thereof: Thus, yellow and blue make green; red and yellow, orange; orange and yellowiſh-green, yellow; and, in the general, if any two Colours be mixed, which, in the ſeries of thoſe generated by the priſm, are not too far apart from their mixture, reſults that colour, which, in the ſaid ſeries, is found in the mid-way between them; but thoſe ſituated at too great a diſtance do not ſo.

Indeed, the more any Colour is compounded, the leſs perfect and vivid it is; by too much compoſition they may be diluted and weakened till they ceaſe.

By compoſition there may be produced Colours not unlike any of thoſe of the homogeneal light.

The moſt extraordinary compoſition is that of whiteneſs, for, to produce this, all the primary colours above-mentioned are required; and thoſe to be mixed in a certain degree.

Hence it is that white is the ordinary colour of light; light being only a confuſed aſſemblage of rays of all Colours.

If the rays of different Colours thus begin to be ſeparated by one refraction of one ſingle ſurface, that ſeparation is much promoted, ſo as even to become ſenſible to the eye, by a double refraction.

This is obſerved in the two ſurfaces of any glaſs, provided thoſe ſurfaces be not parallel; but of all others it is moſt ſenſible in the two faces of a triangular priſm, the phænomena whereof, as they are the touchſtone of all theories of Colours, and as they contain the theory of that we have here delivered, it will be proper to enumerate them diſtinctly.

1. The rays of the ſun, tranſmitted through a triangular priſm, exhibit

exhibit an image of various Colours (the chief of which are red, yellow, green, blue, and violet) on the oppoſite wall.

The reaſon is, that the differently-coloured rays are ſeparated by refraction; for the blue rays, for inſtance, marked with the dotted line (ſee plate A. fig. 2.) which begin to be ſeparated from the reſt, by the firſt refraction, in *d d*, of the ſide, *c a*, of the priſm, *a b c*, (as alſo in the firſt ſurface of the globe of water, *a b c*, fig. 3.) are ſtill further ſeparated in the other ſide of the priſm, *b c*, (as alſo in their egreſs out of the globe, *e b c*) by a ſecond refraction, in *c e*, in the ſame direction as the former; whereas, on the contrary, in the plane glaſs, *e b c f*, fig. 5. (as alſo in the priſm, *k l o*, fig. 4. now placed in another ſituation) thoſe blue rays, which begin to be ſeparated from the reſt in the firſt ſurface, in *d d*, by a ſecond refraction, the contrary way paſs out parallel, i. e. re-mixed with all the Colours of the other rays.

2. That image is not round, but oblong; its length, when the priſm is an angle of ſixty or ſixty-five degrees, being five times its breadth. The reaſon is, that ſome of the rays are refracted more than others; and by that means exhibit ſeveral images of the ſun extended lengthwiſe, inſtead of one.

3. Thoſe rays which exhibit yellow, are turned further from the rectilinear courſe than thoſe which exhibit red; thoſe which exhibit green, than thoſe which exhibit yellow; but, of all others, thoſe which exhibit violet the moſt. Accordingly, if the priſm, through which the light is tranſmitted, be turned about its axis, ſo as the red, yellow, green, &c. rays be projected in order, through a narrow aperture, into another priſm, placed at the diſtance of about twelve feet; the yellow, green, &c. rays, though falling through the ſame aperture in the ſame manner, and on the ſame point of the ſecond priſm, will not be refracted to the ſame place as the red, but to a point at ſome diſtance from it, on that ſide to which the rotation is made. This is what Sir Iſaac Newton calls the experimentum crucis; being that which led him out of the difficulties into which the firſt phænomenon, &c. had thrown him, and plainly ſhewed a different degree of refrangibility, and a different Colour correſponding thereto in the rays of light; and that yellow rays, for inſtance, are more refracted than red ones, green ones more than yellow ones, and blue and violet ones moſt of all.

4. The Colour of coloured rays, well ſeparated by the priſm, are not at all changed or deſtroyed by paſſing an illuminated medium; nor, by their mutual decuſſation, their bordering on a deep ſhadow; nor their being reflected from any natural body, or refracted through any one, in a place howſoever obſcure. The reaſon is, that Colours are not modifications ariſing from refrac-

tion

on or reflection, but immutable properties, and ſuch as belong o the nature of the rays.

5. An aſſemblage of all the kinds of coloured rays, collected ther by ſeveral priſms, by a convex lens, or a concave mirror, r in any other manner, from what we call whiteneſs; yet each f theſe, after decuſſation becoming ſeparated again, exhibits its roper Colour; for, as the ray was white before its parts were ſe- arated by refraction, ſo, the parts being re-mixed, it becomes hite again; and coloured rays, when they meet together, do ot deſtroy one another, but are only interſperſed: Hence a red, reen, yellow, blue, and violet colour, being mixed in a certain roportion, appear whitiſh, i. e. are of ſuch a Colour as ariſes rom white and black mixed together, and, if there were not ſome ays abſorbed and loſt, would be plainly white. In like man- er, if a paper, cut into a circle, be ſtained with each of thoſe Colours ſeparately, and in a certain proportion; then ſwiftly urned round its center, ſo that the ſpecies of Colours be mixed ogether in the eye; by the briſkneſs of the motion, the ſeveral Colours will diſappear; and the whole paper appear of one con- inued Colour, which will be a mean between white and black.

6. If the rays of the ſun fall very obliquely on the inner ſur- ace of a priſm, thoſe that are reflected will be of a violet Colour; hoſe that are tranſmitted red. For the rays were coloured be- ore any ſeparations; and, by how much the more they are re- rangible, by ſo much they are the more eaſily reflected, and by hat means are ſeparated.

7. If two hollow priſms, the one being filled with a blue fluid, nd the other with a red one, be joined together, they will be paque, though each, being apart, will be tranſparent: For, the ne tranſmitting none but blue rays, and the other none but red nes, the two together will tranſmit none at all.

8. All natural bodies, eſpecially white ones, viewed through priſm held to the eye, appear fimbriated, or bordered on one ide with red and yellow, and on the other with blue and violet. For thoſe fimbriæ are the extremes of intire images, which the ays of any kind, as they are more or leſs refracted, would ex- hibit nearer or at a greater diſtance from the real place of the bject.

9. If two priſms be ſo placed, as that the red of the one, and he purple of the other meet together, in a paper fit for the pur- poſe, incompaſſed with darkneſs, the image will appear pale; nd, if viewed through a third priſm, held to the eye at a proper diſtance, it will appear double, the one red, and the other purple. n like manner if two powders, the one perfectly red, and the other blue, red and purple be mixed, any little body, covered pretty deeply with this mixture, and viewed through a priſm held to the

eye,

eye, will exhibit a double image, the one red, and the oth blue; becauſe the red and purple, or blue rays, are ſeparated b their unequal refraction.

10. If the rays tranſmitted through a convex lens be receiv on a paper, before they meet in a focus, the confines, or bou dary of light and ſhadow, will appear tinged with a red Colou but, if they are received beyond the focus, a blue one: Becau in the firſt caſe, the red rays, being ſomething more refract are the higher; but in the ſecond, after decuſſation in the focu the blue ones.

Laſtly, if the rays, about to paſs through either ſide of t pupil, be intercepted by the interpoſition of any opaque bo near the eye, the extremes of bodies, placed as if viewed throu a priſm, will appear tinged with Colours, though thoſe not ve vivid: For then the rays, tranſmitted through the reſt of the p pil, will be ſeparated by refraction into Colours, without bei diluted with the admixture of the intercepted rays, which wou be refracted in a different manner. And hence it is, that a bod viewed through a paper pierced with two holes, appears doub and alſo tinged with Colours.

Of the COLOURS *of thin plates.* As rays of different Colou are ſeparated by the refraction of priſms, and other thick bodies ſo are they ſeparated, though in a different manner, in the thi lamellæ or plates of any pellucid matter, for inſtance, the bub bles raiſed in water thickened by ſoap, &c.

For all lamellæ, under a determinate thickneſs, tranſmit ra of all Colours, without reflecting any at all; but, as they increa in thickneſs in arithmetical proportion, they begin to reflect firſ blue rays; then, in order, green, yellow, and red, more and mor mixed and diluted, till at length, arriving at a certain thickneſs they reflect rays of all Colours, perfectly intermixed, which form a white.

But, in whatſoever part a ſlender lamella reflects any one Co lour, for example, blue, in that part it always tranſmits the op poſite colours, for inſtance, red or yellow.

It is found by experiment, that the difference of Colour of a plate does not depend upon the medium that incompaſſes it, but the degree of vividneſs does; cæteris paribus, the Colour will be more vivid, if the denſer medium be incompaſſed with a rarer.

A plate, cæteris paribus, reflects more light as it is thinner, as far as a certain degree of thinneſs, beyond which it reflects no light at all.

In plates, the thickneſs of which increaſes in an arithmetical progreſſion of the natural numbers 1, 2, 3, 4, 5, &c. if the firſt or thinneſt reflect any homogeneal ray, the ſecond will tranſ-

mit it; and thus is the ſame ray alternately reflected and tranſmitted, i. e. the plates correſponding to the odd numbers, 1, 2, 3, 5, 7, &c. will reflect the ſame rays, that thoſe correſponding to the even ones, 2, 4, 6, 8, &c. tranſmit.

Hence an homogeneous Colour in a plate is ſaid to be of the firſt order, if the plate reflect all the rays of that Colour. In a plate, whoſe thinneſs is in a threefold proportion to the firſt, it is ſaid to be of the ſecond order; in another, whoſe thinneſs is five times that of the firſt, it is ſaid to be of the third order, &c.

A Colour of the firſt order is the moſt vivid of any, and ſucceſſively the vividneſs of the Colour increaſes, as the quantity of the order increaſes; the more the thickneſs of the plate is increaſed, the more Colours it reflects, and thoſe of more different orders.

In ſome plates the Colour will vary as the poſition of the eye varies; in others it is permanent.

COLOURS *of natural bodies.* Bodies only appear of different Colours, as their ſurfaces are diſpoſed to reflect rays of this or that Colour alone, or of this or that Colour more abundantly than any other; hence bodies appear of that Colour which ariſes from the mixture of the reflected rays.

All natural bodies conſiſt of very thin tranſparent lamellæ; which, if they be ſo diſpoſed in regard to each other, as that there happen no reflections or refractions in their interſtices, thoſe bodies become pellucid or tranſparent; but, if their intervals be ſo large, and thoſe are filled with ſuch matter, or ſo empty, in reſpect to the denſity of the parts themſelves, as that there happen a number of reflections and refractions within the body, the body in that caſe becomes opaque.

The rays, which are not reflected from an opaque body, penetrate into it, and, there ſuffering innumerable reflections and refractions, at length unite themſelves to the particles of the body itſelf.

Hence an opaque body grows hot the ſooner, as it reflects light leſs copiouſly; whence we underſtand the reaſon why a white body, which reflects almoſt all the rays that ſtrike upon it, heats much more ſlowly than a black one, which reflects ſcarce any.

In order to determine that conſtitution of the ſurface of bodies, wherein their Colour depends, it muſt be obſerved, that the ſmalleſt corpuſcles, or firſt particles of which ſurfaces are made up, are moſt thin and tranſparent, and ſeparated by a medium of a different denſity from the particles themſelves.

So that, in the ſurface of every coloured body, are innumerable ſmaller thin plates, correſponding to thoſe of bubbles; wherefore, what has been obſerved of thoſe may be underſtood of theſe.

Hence it is gathered, that the Colour of a body depends upon the denſity and thickneſs of the parts of the body, between the pores of the ſurface; that the Colour is more vivid and homogeneous, as the parts are thinner; that, cæteris paribus, the ſaid parts are the thickeſt when the body is red, and the thinneſt when violet; that the parts of bodies are uſually much denſer than the medium contained in their interſtices; but that, in the tails of peacocks, ſome ſilks, and, generally, in all bodies whoſe Colour varies according to the ſituation of the eye, it is leſs; and that the Colour of a body is the leſs vivid to the eye, as it has a denſer medium within its pores.

Now, of the ſeveral opaque bodies, thoſe conſiſting of the thinneſt lamellæ are black; thoſe conſiſting either of the thickeſt lamellæ, or of lamellæ very different from each other in thickneſs, and on that account fitted to reflect all Colours, as the froth of water, &c. are white.

Thoſe again, conſiſting of lamellæ, moſt of which are of ſome intermediate thickneſs, are blue, green, yellow, or red, inaſmuch as they reflect the rays of that particular Colour much more copiouſly than that of any other Colour; moſt of which laſt they either abſorb or extinguiſh, by intercepting them, or elſe they tranſmit light.

Hence it is, that ſome liquors, for inſtance, an infuſion of lignum nephriticum, appear red or yellow, if viewed by reflected light, and blue by tranſmitted light; and leaves of gold yellow, if viewed by reflected light, but green or blue in the latter.

To this we may add, that ſome of thoſe powders, uſed by painters, have their Colour changed by being very finely ground; which muſt be cauſed by the comminution, or breaking of their ſmall parts into others ſtill ſmaller, juſt as a lamella has its Colour altered by altering its thickneſs.

In ſhort, thoſe odd phænomena, ariſing from the mixture of liquors of different Colours, can no way be better accounted for, than from the various actions of the ſaline, &c. corpuſcles of one liquor, with the coloured corpuſcles of another; if they unite, the maſs will either ſwell or ſhrink, and thereby its denſity will be altered; if they ferment, the ſize of the particles may be diminiſhed, and thereby the coloured liquor may become tranſparent; if they coagulate, an opaque liquor may be produced of two tranſparent ones.

Hence it is eaſy to conceive, why a coloured liquor, in a glaſs of a conical figure, placed between the eye and the light, appears of a different Colour in different parts of the veſſel; there being more and more rays intercepted, as they paſs through a longer or ſhorter ſection of the veſſel, till at the baſe they are all intercepted, and none ſeen but thoſe that are reflected.

From the various Colours of natural bodies (Sir Iſaac Newton obſerves) the bigneſs of their component parts may be eſtimated; for that the parts of bodies do properly exhibit the ſame Colour with a lamella of equal thickneſs, provided the denſity in both be the ſame.

The ſeven painting COLOURS *in general.* 1. The chief whites are ſpodium, ceruſs, white lead, Spaniſh white, and egg-ſhells burnt.

The Spaniſh white is thus made:

Take fine chalk ſix ounces, alum two ounces; grind them together, in fair water, till it be like pap; roll it up into balls, which dry leiſurely; then put them into the fire till they are red-hot; take them out, and let them cool. This is the beſt white of all to garniſh with, being ground with weak gum water.

2. The chief blacks are, hartſhorn burnt, ivory burnt, lamp-black, charcoal, ſea-coal, verditer burnt, and mummy burnt.

3. The chief reds are, carmine, vermilion, red lead, Indian lake, native cinnabar, red oker, yellow oker burnt, and Indian red.

4. The chief greens are, green bice, green pink, verdigreaſe, verditer, ſap-green, and pink, mixed with bice.

5. The chief yellows are, orpiment, maſticote deep and light, ſaffron, pink-yellow dark and light, oker de luce, Engliſh oker, Roman oker, and gall-ſtone.

6. The chief blues are, ultramarine, indigo, ſmalt, and blue bice.

7. The chief browns are, umber, Spaniſh brown, Cologn earth, gall-ſtone, ruſt of iron, and mummy.

This is to be noted, that, of the Colours before-named, vermilion, verdigreaſe, orpiment, and ſome others are too coarſe and gritty to be uſed in water colours, unleſs they be purified and prepared. And turnſole, litmoſe-blue, roſet, braſil, logwood, and ſaffron are more fit for waſhing prints, than curious limning.

COLOURS, in painting, is a term applied both to the drugs, and the tints produced by thoſe drugs, variouſly mixed and applied.

Painters reduce all the Colours they uſe under theſe two claſſes, dark and light Colours.

Dark Colours are black, and all others that are obſcure and earthy, as umber, biſtre, &c.

Under light Colours are comprehended white, and all thoſe that approach neareſt it.

Painters alſo diſtinguiſh Colours into ſimple and mineral.

Under ſimple Colours they rank all thoſe which are extracted from vegetables, and which will not not bear the fire; as the yellow made of ſaffron, French berries, lacca, and other tinc-

tures extracted from flowers, uſed by limners, illuminers, &c.

The mineral Colours are thoſe which are drawn from metals, &c. and that are able to bear the fire; uſed by enamellers.

Colours are alſo divided, by ſome, into changeable and permanent.

Changeable Colours are ſuch as depend on the ſituation of the objects with reſpect to the eye, as that of a pigeon's neck, taffeta's, &c. the firſt, however, being attentively viewed with a microſcope, each fibre of the feathers appears compoſed of ſeveral little ſquares, alternately red and green; ſo that they are fixed Colours. Kircher ſays, that the changeable Colour obſerved in the wings of pigeons, peacocks, &c. ariſes from the feathers being tranſparent, and of a figure reſembling a priſm; and, conſequently, the lights being differently refracted from them.

Permanent Colours are not exhibited by refraction, but by reflection.

COLOURS, *in particular*. Ceruſs; grind it with glair of eggs, and it will make a very good white. It is too yellow for ſome purpoſes, coarſe and gritty.

White lead; grind it with a weak water of gum lake, and let it ſtand three or four days, and, if it be afterwards mixed with roſet and vermilion, it will make a fine carnation.

Spaniſh white, being ground with gum water, is the beſt white of all to garniſh with.

Lamp-black, makes a good black, being ground with gum water.

Vermilion, if it be ground with the glair of an egg, and a little clarified honey, to make it bright and perfect, is good; but native cinnabar is better, and of a more lively Colour.

Cinnabar lake, makes a deep and beautiful red, or rather purple, almoſt like a red roſe; grind it with gum lake and turnſole water; if you will have it light, add a little ceruſs, and it will make it a bright crimſon; if it be to diaper, add only turnſole water.

Red lead; grind it with ſome ſaffron and a ſtiff gum water; the ſaffron will make it orient and of a marygold colour.

Turnſole; lay it in a ſaucer of vinegar, and ſet it over a chafing-diſh of coals; when it boils, take it off, and wring it into a ſhell, adding a little gum arabic; let it ſtand till it is diſſolved; this is good for ſhadowing carnation and all yellows.

Roſet; grind it with braſil water, and it will make a deep purple; put ceruſs to it, and it will be lighter; grind it with litmoſe, and it will make a fair violet.

Spaniſh brown; grind it with braſil water, mingle it with ceruſs, and it will make a horſe-fleſh colour. It is not ſo briſk and lively as Indian red.

Bole armoniac, makes but a faint colour; the chief uſe of it is in making ſize for burniſhed gold.

Green bice, is to be ordered as you do blue bice; when it is moiſt and not thorough dry, you may diaper upon it with the water of deep green.

Verdigreaſe; grind it with juice of rue and a little weak gum water, and you will have a moſt pure green; if you would diaper with it, grind it with ley of rue, or the decoction thereof, and it will make a hoary green. Diaper upon verdigreaſe, green with ſap green.

Verdigreaſe, ground with white tartar, and then tempered with gum water, gives a moſt perfect green.

Verditer; grind it with a weak gum arabic water; it is the fainteſt green that is, but is good to lay upon black in any kind of drapery.

Sap-green; lay it in ſharp vinegar all night, put into it a little alum to raiſe its colour, and you will have a good green to diaper upon other greens.

Orpiment, Arſenicum, Auripigmentum, } grind it with a ſtiff water of gum lake; becauſe it is the beſt Colour itſelf, it will lie upon no green; for all greens, white and red lead, and ceruſs ſtain it. Wherefore, you muſt deepen your Colours ſo, that the orpiment may be higheſt, and ſo it may agree with all Colours.

Maſticote; grind it with a ſmall quantity of ſaffron in gum water, and never make it lighter than it is; it will endure to lie upon all Colours and metals.

Saffron; ſteep it in glair, it may be ground with vermilion.

Pink yellow, if you would have it ſad-coloured, grind it with ſaffron; if light, with ceruſs; mix it with gum water, and ſo uſe it.

Oker de luce; grind it with pure braſil water, and it will make an excellent hair Colour, and is a natural ſhadow for gold. Roman oker is the moſt glowing oker of all.

Umber, is a ſad brown Colour; grind it with gum water or gum lake, and lighten it, if you pleaſe, with a little ceruſs and a blade of ſaffron; to cleanſe it, burn it in a crucible, then grind it, and it will be good; and, when you temper it in the ſhell, uſe a drop or two of onion water, and it will preſerve it from cracking.

Ultramarine; if you would have it deep, grind it with litmoſe water, but, if light, with fine ceruſs and a little gum arabic water. In grinding ultramarine and other Colours, be not too ſwift in your motion, but let it be gentle and ſlow, becauſe the ſwiftneſs of the motion heats the ſtones, which will cauſe your Co-

lour to ſtarve, or loſe ſomewhate of its luſtre, eſpecially, if it be a Colour of no great body, as pink, indigo, &c.

Indigo; grind it with water of gum arabic, as you do ultramarine.

Blue bice; grind it with clean water, as fine as can be, and then put it into a ſhell, and waſh it, as follows: Put as much water to it as will fill up the ſhell or veſſel you put it into, and ſtir it well; let it ſtand for an hour, then throw away the filth and dirty water, and put in more clean water; do thus four or five times. Then put ſome weak gum arabic water to it, that the bice may fall to the bottom; pour off the gum water, and put more to it; waſh it again, dry it and mix it with weak gum water, if you would have it riſe of the ſame colour; but with a ſtiff water of gum lake, if you would have a moſt perfect blue; but grind it with a little ceruſs, if you would have it a light blue; if you would have it a very deep blue, add litmoſe water.

Smalt; grind it with a little fine roſetta, and it will make a deep violet, and, by putting in a quantity of ceruſs, it will make a light violet.

Litmoſe blue; grind it with ceruſs; with a pretty deal of litmoſe, it will make a deep blue, and, with a pretty deal of ceruſs, it will make a light blue; grind it with the weak water of gum arabic.

Take fine litmoſe, cut it in pieces, lay it in weak water of gum lake for twenty four hours, and you will have a water of a moſt perfect azure; with which water you may diaper and damaſk upon all other blues, to make them appear more fair and beautiful.

Orchal. Grind it with unſlacked lime and urine, it makes a pure violet; by putting to more or leſs lime, you make the violet light or deep as you pleaſe.

Mummy, makes a good black; but it is commonly ill-conditioned, hard, and will not flow from the pencil, till burnt in a crucible well luted.

Engliſh oker. It is a yellow colour, and lies even in the ſhell of itſelf; it is of great uſe, being well ground.

Pink mixed with blue bice. It is a good green; the faireſt pink is beſt, well ground and tempered with blue bice, allowing one quantity of pink to three of blue bice. If you would deepen it for landſcapes or drapery, mix a little indigo finely ground with it.

Indian lake. This makes a delicate purple; grind it with a little gum water, and when it is fine, before you put it into the ſhell, mix a little powder of white ſugar-candy with it, which will preſerve it from cracking; then you may ſpread it thinly with your finger about the ſhell.

Indian

Indian red, makes a very dark red; becauſe this colour is very coarſe, you may uſe umber and a little lake tempered, which is as good.

Ivory-black. Grind it with a little white ſugar-candy, and it will preſerve it from crackling out of your ſhells; it makes a fine black.

Cherry-ſtone, is burnt in a crucible, as is the former, and ſo ground. It is good for drapery, and for a black ſattin; temper it with a little white Indian lake and indigo. Heighten it with a little lighter mixture; deepen it with ivory-black.

Caput mortuum of vitriol. Firſt grind it well upon a marble; then waſh it well, and grind it with a weak gum lake water; it will make a deep red, or almoſt purple Colour.

Obſervations on mineral COLOURS. 1. Sublimate, diſſolved in fair water, and mixed with a little ſpirit of urine, makes a milk-white mixture in a moment; which, by an addition of aqua-fortis, becomes tranſparent again immediately.

2. If you ſublime together two ounces of ſublimate, and one ounce of tin-glaſs, you will have a ſublimate not inferior to the beſt orient pearls in the world.

3. Silver diſſolved in aqua-fortis, and evaporated to dryneſs, and having had water poured two or three times upon it, and evaporated till the calx is dry, leaves it of a ſnow whiteneſs; which rubbed upon the ſkin, wetted with ſpittle, water, or the like, produces a blackneſs not to be got off in ſome days.

With this may be dyed ivory, hair, and horns, in fair water, of a laſting black.

4. Coral, diſſolved by oil of vitriol, ſulphur, or ſpirit of vinegar, and precipitated by oil of tartar, yields a ſnow whiteneſs.

The ſame of crude lead and quickſilver diſſolved in aqua-fortis. So butter of antimony, rectified by bare effuſion in a good quantity of fair water, will, though unctuous, be precipitated into that ſnow-white powder, which, being waſhed from its corroſive ſalts, is called mercurius vitæ. The like of which may be made without the addition of any mercury.

5. Mercury ſublimate and precipitate yield, with the ſpirit of urine, hartſhorn, or the like, a white precipitate; but with the ſolution of pot-aſhes, or other lixiviate ſalts, an orange-tawny.

And, if on a filtrated ſolution of vitriol you put the ſolution of a fixed ſalt, there will ſubſide a copious ſubſtance, far from whiteneſs, which chymiſts call the ſulphur of vitriol.

6. If two ounces of copper be mixed with one ounce of tin, the reddiſhneſs will vaniſh; and if arſenic, calcined with nitre, in a juſt proportion, be mixed with melted copper, it will be blanched both within and without.

7. Fine powders of blue bice and yellow orpiment, ſlightly

mixed, produce a good green; and a high yellow ſolution of a good gold in aqua regia, mixed with a due quantity of a deep blue ſolution of crude copper in ſtrong ſpirit of urine, produces a tranſparent green; and ſo blue and yellow enamel fuſed together in the flame of a lamp, being ſtrongly blowed on without ceaſing, produces at length a green Colour.

8. An urinous ſalt, put in a large quantity into the diſſolution of blue vitriol in fair water, turns the liquor and corpuſcles, which reſided, into a yellowiſh Colour like yellow oker.

9. Verdigreaſe, ground with ſal armoniac, and the like, digeſted for a while in an horſe dunghill, makes a glorious blue.

10. The true glaſs of antimony, extracted with acid ſpirits, with or without wine, yields a red tincture.

11. Balſam of ſulphur, of a deep red in the glaſs, ſhaked about, or dropped on paper, gives a yellow ſtain.

12. If brimſtone and ſal armoniac powdered, of each five ounces, be mixed with ſix ounces of quick-lime in powder, and diſtilled in a retort in ſand by degrees, you will have a volatile ſpirit of ſulphur of excellent redneſs, though none of the ingredients be ſo.

So alſo oil of aniſeeds, mixed with oil of vitriol, gives, in a trice, a blood-red Colour, which ſoon decays.

13. Fine ſilver diſſolved in aqua-fortis, and precipitated with ſpirit of ſalt, upon the firſt decanting the liquor, the remaining matter will be purely white; but, lying uncovered, that which is expoſed to the ambient air will loſe its whiteneſs.

14. Sublimate, diſſolved in a quantity of water and filtred, till it is as clear as cryſtal, mixed, in a Venice glaſs, with good oil of tartar per deliquium filtred, three or four drops to a ſpoonful, will yield an opacous liquor, or deep orange Colour; after which, if four or five drops of vitriol be dropped in, and the glaſs ſtraightway be ſtrongly ſhaken, the whole liquor will, to admiration, be colourleſs without ſediment.

And if the filtred ſolution of ſublimed ſal armoniac and ſublimate, of each alike, be mixed with the ſolution of an alcali, it will be white.

15. Spirit of ſal armoniac makes the ſolution of verdigreaſe an excellent azure; but it makes the ſolution of ſublimate yield a white precipitate.

16. So the ſolution of filings of copper in ſpirit of urine, made by fermentation, produces a lovely azure colour; which, with oil of vitriol, a few drops to a ſpoonful, is in a trice deprived of the ſame, and rendered like fair water.

And ſo alſo a ſolution of verdigreaſe in fair water, mixed with ſtrong ſpirit of ſalt, or dephlegmated aqua-fortis, makes the greenneſs almoſt totally diſappear.

17. Quick-

17. Quickſilver, mixed with three or four times its weight of good oil of vitriol, and the oil drawn off in ſand, through a glaſs retort, leaves a ſnow-white precipitate, which, by the affuſion of fair water, becomes one of the loveliеſt light yellows in the world, and a durable Colour.

18. Tin, calcined per ſe by fire, affords a very white calx, called putty; lead, a red powder, called minium; copper, a dark or greyiſh powder; iron, a dirty yellowiſh colour, called crocus martis; and mercury, a red powder.

19. Gold, diſſolved in aqua regia, ennobles the menſtruum with its own colour; ſilver coin, diſſolved in aqua-fortis, yields a tincture like that of copper; but fine ſilver, a kind of bluiſhneſs. Copper, diſſolved in ſpirit of ſugar, drawn off in a glaſs retort, or in oil, or ſpirit of turpentine, affords a green tincture; but, in aqua-fortis, a blue.

20. Vermilion, is made of mercury and brimſtone, ſublimated together in a due proportion.

21. You may give glaſs a noble golden Colour with quick-ſilver; but it is now coloured yellow, generally with calx of ſilver; yet, ſhell-ſilver, ſuch as is generally uſed with pen or pencil, mixed with a convenient proportion of powdered glaſs, in three or four hours fuſion, gives a lovely ſappharine blue.

22. Glaſs is tinged green, by the glaſs-men, with the calx of Venus; which calx, mixed with a hundred times its weight of fair glaſs, gives, in fuſion, a blue coloured maſs.

23. Putty, which is tin calcined, as it is white of itſelf, ſo it turns the purer ſort of glaſs-metal into a white maſs, which, when opacous enough, ſerves for a white enamel.

24. The white enamel is as it were the baſis of all thoſe fine concretes, which goldſmiths and ſeveral artificers uſe in the curious art of enamelling.

For this white and fuſible ſubſtance will receive into itſelf, without ſpoiling them, the Colours of divers other mineral ſubſtances, which, like it, will endure the fire.

25. Glaſs is tinged blue, with the dark mineral, called zaffer or zaffora; and with manganeſe or magneſſa, in a certain proportion, glaſs may be tinged of a red Colour, and alſo of a purpliſh or murrey; and with a greater quantity, into that deep Colour which paſſes for black.

26. Yellow orpiment, ſublimed with ſea ſalt, yields a white and cryſtalline arſenic; arſenic, calcined with pure nitre, being duly added to Venus in the fuſion, gives it a whiteneſs both within and without.

27. So lapis calaminaris turns Venus or copper into braſs.

28. And zink, duly mixed with Venus, when it is in fuſion, gives

gives it the nobleſt golden colour, that was ever ſeen in the beſt gold; but it will not endure various meltings.

29. Copper, diſſolved in aqua-fortis, will imbue ſeveral bodies of the Colour of the ſolution.

30. Gold, diſſolved in aqua regia, will, though not commonly known, dye horn, ivory, and other bones of a durable purple Colour.

31. Laſtly, cryſtals of ſilver, made with aqua-fortis, though they appear white, will preſently dye the ſkin, nails, hair, and bones, with a black not to be waſhed off.

Obſervations on vegetable COLOURS. 1. A ſtrong infuſion of galls filtred, mixed with a ſtrong and clear ſolution of vitriol, makes a mixture as black as ink; which, with a little ſtrong oil of vitriol, becomes tranſparent again. After which, by the affuſion of a little quantity of a ſtrong ſolution of ſalt of tartar, it regains its black Colour.

The firſt black, although pale in writing, yet, being dry, appears to be good ink.

2. A decoction of red roſes, dried in fair water, mixed with a filtrated ſolution of blue vitriol, makes a black Colour; and this, being mixed with a little aqua-fortis, turns it from a black to a deep red; which, by the affuſion of a little ſpirit of urine, may be preſently reduced to a thick and black Colour.

3. Yellow wax, is whitened by diſſolving it over the fire in ſpirit of wine; letting it boil a little, and then exhaling the ſpirit, or elſe, while it is hot, ſeparating it by filtration.

4. Fair water, mixed with a blood-red tincture of benjamin, drawn with ſpirit of wine, immediately makes it of a milk-white Colour.

5. Blackneſs may be taken away with oil of vitriol; ſo black pieces of ſilk or hair may be turned to a kind of yellow.

6. A handful of lignum nephriticum raſped, infuſed in four pounds of ſpring water, yields between the light and the eye an almoſt golden Colour, except the infuſion be too ſtrong; but, with the eye, between the light and it, in a clear phial, a lovely blue, as indeed it is. This, with ſpirit of vinegar, may be made to vaniſh, ſtill keeping its golden Colour; and, afterwards, with oil of tartar per deliquium, may be reſtored again.

7. Cloth, dyed with blue and woad, is dyed into a green by the yellow decoction of luteola.

8. Syrup of violets, mixed with a high ſolution of gold in aqua regia, produces a reddiſh mixture; and, with a high ſolution of filings of copper in ſpirit of urine, a lovely fair green.

9. Syrup of violets, mixed with a little juice of lemons, ſpirit of ſalt, vinegar, or the like acid ſalt, will immediately become red; but mixed with oil of tartar, or a ſolution of pot-aſhes,

ſhes, will, in a moment, become a perfect green; and the like in the juice of blue-bottles.

10. A good quantity of oil of tartar, put into a ſtrong ſolution of verdigreaſe, gives a delightful blue, which may be variouſly changed, by adding ſpirit of urine or hartſhorn.

11. Although red roſes, hung over the fume of ſulphur, loſe all their redneſs, and become white; yet oil of ſulphur, which is nothing but the fumes condenſed, doth wonderfully heighten the tincture of the ſame.

12. Cochineal will have its Colour far more heightened by ſpirit of urine, than by rectified ſpirit of wine; and one grain of cochineal in a good ſpirit of urine, being put into a hundred and twenty-ſix ounces of water, tinged it, although but faintly, which amounts to above 125,000 times its own weight.

13. Twenty grains of cochineal, being mixed with an ounce of ſaccharum ſaturni, will make a moſt glorious purple colour; and ſo, accordingly, as the quantity is either diminiſhed or increaſed, ſo the purple colour ſhall be either lighter or deeper.

14. A few grains of cochineal, being mixed with the lixivium of quick-lime in a due proportion, make a fading purple Colour of the greateſt glory imaginable in the world.

15. The juice of privet berries, with ſpirit of ſalt, is turned into a lovely red; but, with a ſtrong ſolution of pot-aſhes, into a delightful green.

16. Spirit of ſalt makes no conſiderable change; but rather a lighter red upon things red by nature, as ſyrup of clove gilliflowers, juice of buckthorn berries, infuſion of red roſes, braſil, &c.

17. Juice of jaſmin and ſnow drops will turn into a deep greeniſh-yellow by a ſtrong alcaline ſolution, although the juice of jaſmin, &c. before were of no Colour.

18. Buckthorn berries, being gathered green and dried, are called ſap-berries, which, being infuſed in alum water, produce a fair yellow, which is uſed by book-binders for the edges of books, and to colour leather alſo; being gathered when they are black, they are called ſap-green, and make a green Colour, being put into a braſs or copper veſſel for three or four days; or a little heated upon the fire, and mixed with alum in powder, and preſſed out; ſo put into bladders, hanging it up till it is dry; and being gathered about the end of November, when they are ready to drop, they yield a purpliſh Colour.

19. Tincture of cochineal, diluted never ſo much with fair water, will never yield a yellow Colour. A ſingle drop of a deep ſolution in ſpirit of urine, diluted in an ounce of fair water, makes a fair pink or carnation.

20. Oil or ſpirit of turpentine, digeſted with pure white ſugar

of

of lead, yields, in a ſhort time, a high red tincture, which chymiſts call balſamum ſaturni.

21. Spirit of ſalt, dropped into a ſtrong infuſion of cochineal or juice of black cherries, makes preſently a fair red; but, dropped into the infuſion of braſil, a kind of yellow. So the filtrated tincture of balauſtin, mixed with good ſpirits of urine, or the like, turns of a darkiſh green; but with ſpirit of ſalt, a high redneſs, like rich claret-wine; which glorious Colour may in a moment be deſtroyed, and turned into a dirty green, by ſpirit of urine.

22. A high infuſion of lignum nephriticum, mixed with ſpirit of urine, produces ſo deep a blue, as to render the liquor opaque; which however vaniſhes, after a day or two, and leaves the liquor of a bright amber Colour.

Where you may take notice, that, inſtead of ſpirit of urine, you may uſe oil of tartar, or a ſtrong ſolution of pot-aſhes.

23. Infuſion of log-wood, in fair water, mixed with ſpirit of ſal armoniac, immediately turns into a deep, rich, lovely purple; two or three drops are enough for a ſpoonful, leſt the Colour be ſo deep as to be opaque.

24. Spirit of ſal armoniac will turn ſyrup of violets to a lovely green.

25. An infuſion of litmoſe in fair water will, in a clear glaſs, give a purple Colour; but will be wholly changed into a glorious yellow, by ſpirit of ſalt being added.

26. The infuſions and juices of ſeveral plants will be much altered by a ſolution of lead in ſpirit of vinegar; it will turn the infuſion of red-roſe leaves into a ſad green.

27. So the tincture of red roſes in fair water would be turned into a thick green, with the ſolution of minium in ſpirit of vinegar; and then with the addition of oil of vitriol the reſolved lead would precipitate white, leaving the liquor of a clear high red Colour.

28. It has not been yet found, that, to exhibit the ſtrong variety of Colours, there is need that any more than theſe five be applied, viz. white, black, red, blue, yellow; for theſe, being variouſly compounded, exhibit a variety and number of Colours; ſo many, that thoſe who are ſtrangers to painting, can hardly imagine.

29. So black and white, variouſly mixed, make a vaſt company of light and deep greys; blue and yellow, a great variety of greens; red and yellow, ſeveral orange-tawnies; red and white, a number of carnations; red and blue, ſeveral purples; and thus are many Colours produced, for which we want names.

30. Acid ſalts deſtroy a blue Colour; ſulphureous, urinous, or fixed, reſtore it.

31. Acid and alkaliſate ſalts, with many bodies that abound with ſulphureous or oily parts, will produce a red, as is manifeſt in the tincture of ſulphur, made with lixiviums of calcined tartar or pot-aſhes.

Of preparing COLOURS. Colours, according to their nature, have each a particular way of preparation, viz. by grinding, waſhing, or ſteeping.

The chief Colours to be ground are, white lead, ceruſs, cinnabar, lake, oker yellow and brown, pink, indigo, umber, Cologn earth, Spaniſh brown, ivory-black, cherry-ſtone black, lamp-black, Indian red, and Indian lake.

The chief Colours to be waſhed are, red lead, maſticote, green bice, cedar green, ultramarine, blue bice, ſmalt, and verditer.

The chief Colours to be ſteeped are, ſap-green, ſaffron, turnſole, ſtone-blue, and French berries.

The method of grinding COLOURS. Take the Colour you would grind, and ſcrape off from it all the filth; then lay it upon the ſtone, and, with the muller, bruiſe it a little; then put to it a little ſpring or weak gum water, and grind all together very well, till the Colour is very fine; which done, pour it out in certain hollows or furrows cut in chalk-ſtone, and there let it lie till it is dry, which preſerve in paper or glaſſes.

Take care in grinding your Colours not to put too much water to them upon the ſtone, for they ought to be ground pretty thick, like pulp or pap; and they ought not to be left too moiſt, but thick and clammy. If, after your colour is dry in the ſhell, you can rub it off with your fingers, it muſt be better bound with gum; and, if there be too much gum, it will ſhine, and be apt to crackle off after it is uſed.

Of mixing and compounding COLOURS. An aſh Colour or grey is made by mixing white and lamp-black, or white with ſinaper; indigo and black make an aſh Colour.

To make an azure or blue. Mix the azure with glue water, and not with gum water.

A bay COLOUR. Mingle vermilion with a little Spaniſh brown and black.

A bright crimſon. Mix tincture of braſil with a little ceruſs ground with fair water.

To make a crimſon lake. It is uſually made of the flocks ſhorn off from crimſon cloth, by a ley made of ſalt-petre, which extracts the Colour; which precipitate, edulcorate, and dry in the ſun, or in a ſtove.

To make a ſad crimſon. Mix the aforeſaid light crimſon with a little indigo, ground with fair water.

To make a flame COLOUR. It is made of vermilion and orpiment,

ment, mixed deep or light at pleaſure: Or thus; take red lead, and mix it with maſticote, which heighten with white.

To make a glaſs-grey. Mingle ceruſs with a little azure.

To make excellent good greens. The liver of a lamprey makes an excellent green, and yellow laid upon blue will change into green; ſo likewiſe the juice of a blue flower de-lis, mixed with gum water, will be a perfect and durable green or blue, according as it is uſed.

To make a light green. It is made of pink or ſmalt with white, to make it whiter, if need require.

To make a lead COLOUR. It is made of white, mixed with indigo.

To make a fleſh COLOUR. Mix a little lake and red lead with white, a very ſmall quantity of each; you may make it as light or as red as you pleaſe, by putting more or leſs white in it. If you would have a ſwarthy complexion, to diſtinguiſh a man's fleſh from a woman's, put a little yellow oker among your fleſh Colour; and, for your ſhadow, put a little more lake, and a ſmall quantity of burnt umber.

To make a murrey, which is compoſed of purple and white; it is made thus, take cinnabar lake, two ounces; white lead, one ounce; and grind them together.

To make a good murrey. Temper roſet with a little roſe water, in which a little gum hath been diſſolved, and it will be good, but not better than the firſt.

To make a pure lake. Take urine, ten pounds; boil it in a kettle, and ſkim it with an iron ſkimmer, till it comes to eight pounds; to which add gum lake, half a pound; alum, two ounces and an half; boil all till it is well coloured, which you may try by dipping a piece of linen cloth in it; then add roche alum in powder, a ſufficient quantity; ſtrain it, and let it ſtand; ſtrain it again through a dry cloth, till the liquor be clear; that which remains in the cloth or bag is the pure lake.

To make a deep purple. This is made of indigo, Spaniſh brown and white.

Another purple. Boil log-wood in vinegar and beer, in a glazed earthen veſſel, adding thereto a little alum, till you taſte it to be ſtrong on your tongue; when it is ſufficiently boiled, ſtrain out the liquor through a cloth, and keep it in a glaſs cloſe ſtopped for uſe.

To make a yellow, green, or purple. Buckthorn-berries gathered green, ſteeped in alum water, yield a good yellow; but, being thorough ripe and black, they yield a good green; and, laſtly, being gathered when they are ready to drop off, which is about the middle or end of November, their juice, mixed with alum water, yields a good purple Colour.

To make a pear-green. Take white tartar and verdigreaſe; temper them with ſtrong white-wine vinegar, in which a little gum arabic has been diſſolved.

To make cloud COLOURS. You may ſometimes take blue verditer, ſometimes light maſticote ſhadowed with blue verditer, or lake and white, or red ink and white, ſhadowed with blue verditer.

To make a red COLOUR. Take the roots of the leſſer bugloſs, viz. alkanet, and beat them, and ſtrain out the juice, and mix it with alum water.

To make a ſcarlet COLOUR. It is made of red lead, lake, and vermilion; yet vermilion, in this caſe, is not very uſeful.

To make a pure purple COLOUR. Take fine brimſtone, an ounce and a half; quickſilver, ſal armoniac, and tin, of each one ounce; pulveriſe the ſalt and brimſtone, and make an amalgama with the quickſilver and tin; mix all together, which put into a great glaſs gourd; make under it an ordinary fire, and keep it in a conſtant heat for the ſpace of ſix hours.

A ſaffron COLOUR, is made of ſaffron alone by infuſion.

To make vermilion. Take brimſtone in powder, four ounces; mix it with quickſilver, a pound; put it into a crucible well luted, and, upon a charcoal fire, heat it till it is red hot, then take it off, and let it cool.

To make a velvet COLOUR. Take a little indigo and tincture of braſil, grind them with a little ceruſs.

To make a yellow. Take the yellow chives in white lilies, ſteep them in gum water, and they will make a perfect yellow; the ſame from ſaffron and tartar tempered with gum water.

Tempering of COLOURS. Take a little of any Colour, and put it into a clean ſhell; add to it a few drops of gum water, and with your finger work it about the ſhell, let it dry, and, when dry, touch it with your finger; if any Colour comes off, you muſt add ſtronger gum water; but, being dry, if the Colour gliſter or ſhine, it is a ſign there is too much gum in it, which you may remedy, by putting in fair water.

To help the defects of COLOURS. Some Colours, as lake, umber, and others which are hard, will crack when they are dry; in this caſe, in tempering them, add a little white ſugar-candy in very fine powder; which mix with the Colour and fair water, in the ſhell, till the ſugar-candy is diſſolved.

To burn or calcine COLOURS. This is to be done in a crucible, covering the mouth of it with clay, and ſetting it in a hot fire, till you are ſure it is red hot through; which done, being cold, waſh or grind them as before directed.

To prepare ſhadows for COLOURS. White is ſhaded with black; and, contrary-wiſe, yellow with umber and the okers; vermilion

vermilion with lake; blue bice with indigo; black-coal with roſet, &c.

To waſh COLOURS. Put the Colour into a glazed veſſel, and put fair water to it plentifully; waſh it well, and decant, after a while, the water; do this ſix or ſeven times; at laſt put the water, being juſt troubled, into another glazed veſſel, leaving the dregs at bottom; then into this ſecond veſſel put more fair water, waſhing it as before, till the water, being ſettled, be clear, and the Colour remain fine at the bottom. Before you take the Colour out of the veſſel, ſpread it very thin, about the ſides thereof, and, when it is dry, ſome of it will fall to the bottom, which keep by itſelf; but the remainder which ſticks to the ſides of the baſon is the beſt of all, which, with a feather, ſtrike off from the ſides of the veſſel, for it will be finer than any flour.

Steeping of COLOURS. Take a quantity of the Colour, put it into a ſhell, and fill the ſhell with fair water, to which add ſome fine powder of alum, to raiſe the Colour; let it thus ſteep a day and night, and you will have a good Colour.

Where, note, ſaffron ſteeped in vinegar gives a good Colour; and the French berries, in fair water and a little alum, or a drop or two of oil of vitriol, make a fair yellow.

But ſome Colours are to be boiled, as braſil, logwood, turnſole, rinds of walnuts, wood ſoot, &c. theſe, when boiled, are to be kept cloſe ſtopped in glaſſes, till you have occaſion to uſe them.

COLOURS *uſed in dying.* There are in the art of dying five Colours, called ſimple primary or mother Colours; from the mixture of which all the other Colours are formed; theſe are blue, red, yellow, brown, and black.

Of theſe Colours, variouſly mixed and combined, they form the following Colours, panſy, blue and red; from the mixture of blue and ſcarlet are formed amaranth, violet, and panſy; from the ſame mixture of blue and crimſon-red are formed the columbine or dove Colour, purple, crimſon, amaranth, panſy, and crimſon-violet.

Here it is to be obſerved, that they give the name of crimſon to all Colours made with cochineal.

Of blue and red madder is dyed purple, pepper Colour, tan Colour, and dry-roſe Colour.

The ſame blue, with red half in grain, makes amaranth, tan Colour, and dry-roſe Colour.

Blue and half-red crimſon compoſe amaranth, tan Colour, dry roſe, a brown panſy, and ſur-brown.

Blue and yellow mixed together compoſe a yellow-green, ſpring-green, graſs-green, laurel-green, brown-green, dark-green;



Facing P. 128.

Plate. A.

Fig. 1.

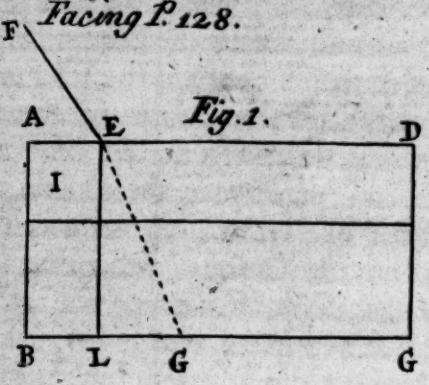
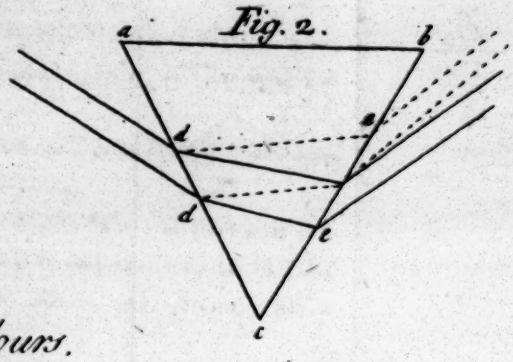


Fig. 2.



Colours.

Fig. 3.

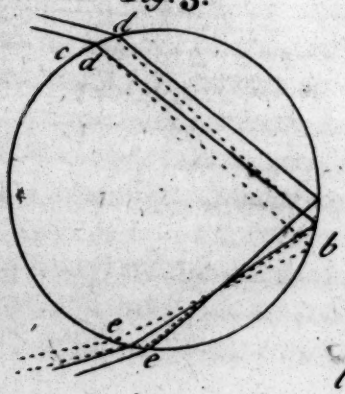


Fig. 4.

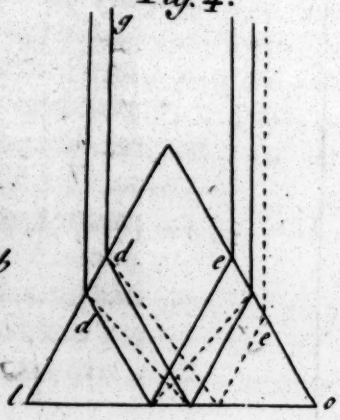
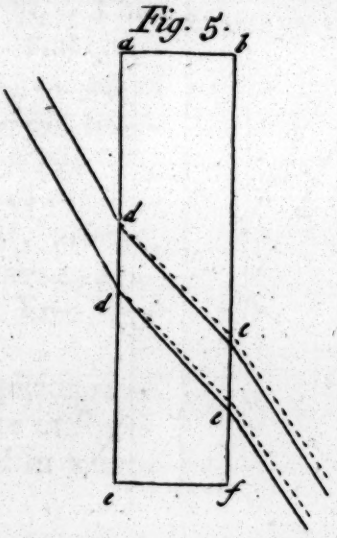
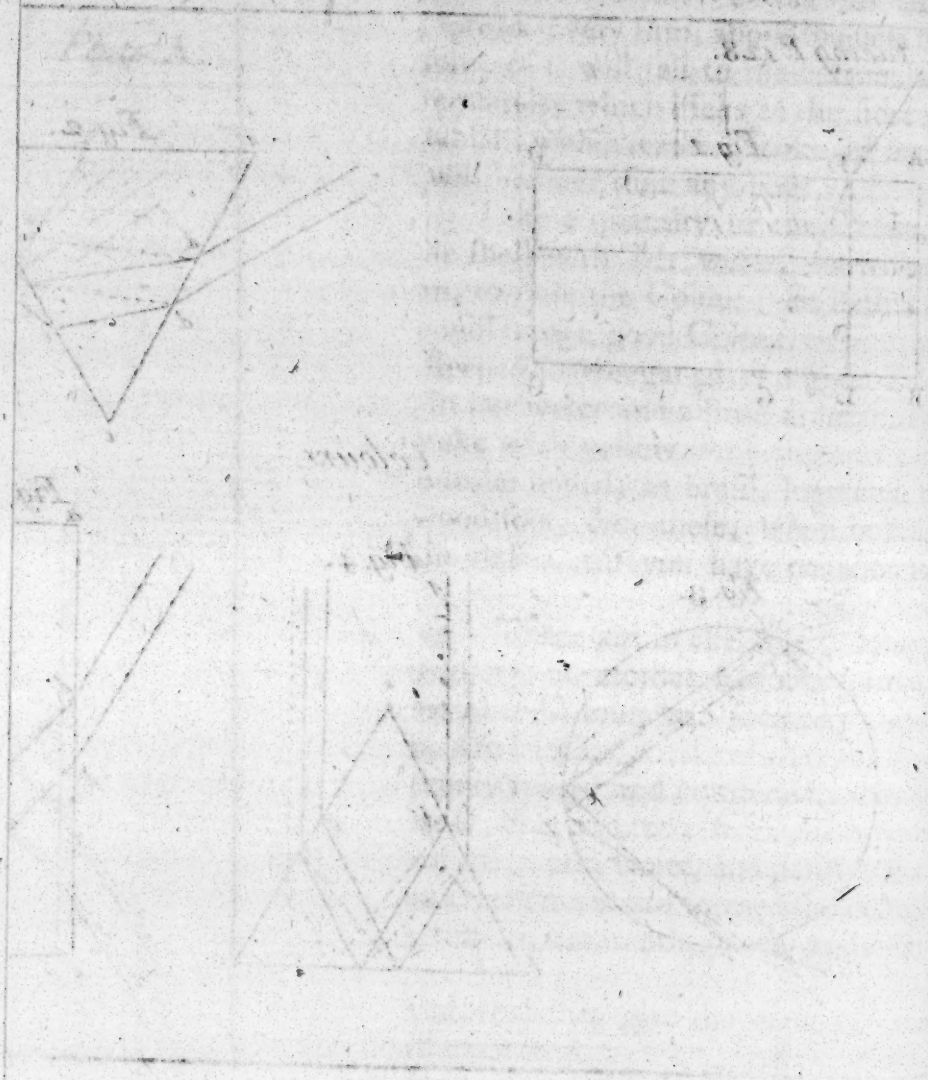


Fig. 5.





green; as well as ſea-green, parrot-green, cabbage-green, &c. theſe three laſt Colours are to be leſs boiled than the reſt.

This is to be noted, that as to green there is no ingredient or drug in nature that will dye it; but the ſtuffs are dyed twice, firſt in blue, then in yellow.

Blue and brown. Theſe two Colours are never mixed alone, but with the addition of red, either of madder or cochineal, they form ſeveral Colours.

Red and yellow. All the ſhades compoſed of theſe two Colours, as gold-yellow, aurora, marygold, orange, nacarat, granate-flower, flame colour, &c are made with yellow and red of madder; ſcarlet being leſs proper as well as too dear.

Red and brown. Of theſe two Colours are formed cinnamon colour, cheſnut, muſk, bear's hair, and even purple, if the red be that of madder.

Yellow and brown. The Colours formed from theſe two are all the ſhades of feuille mort and hair Colours.

But this may be obſerved, that, though it be ſaid, there are no Colours or ſhades made from ſuch and ſuch mixtures, it is not meant, that none can be made, but that they are more eaſily formed from a mixture of other Colours.

COLOURING *and Non* COLOURING *Drugs*. Thus dyers diſtinguiſh their drugs; the firſt are applicative, and communicate their colours to the matters boiled in them, or paſſed through them. As woods, ſcarlet grain, cochineal, indigo, madder, turmeric, &c. the ſecond ſerve to prepare and diſpoſe the ſtuffs and other matters, and to extract the colours out of the Colouring ingredients; as alum, ſalt or cryſtal of tartar, arſenic, realgal, ſaltpetre, common ſalt, ſal armoniac, ſal gemmæ, agaric, ſpirit of wine, bran, peaſe-flour, wheat, ſtarch, lime, and aſhes.

COLOURING *in painting*. The manner of applying and conducting the colours of a picture; or it is the picture of lights and ſhadows formed by the various colours employed in painting.

The Colouring is one of the principal branches in painting. M. Felibien divides the painter's art into three parts, the deſign, the compoſition, and the Colouring.

The Colouring ſtrikes the moſt, but among maſters it always gives place to the deſign.

M. de Piles obſerves, that the word Colouring, in its confined ſenſe, is chiefly applicable to a hiſtory-piece, ſcarce at all to a landſcape. He adds, that the term Colouring relates more immediately to the carnations, than any thing elſe.

The Colouring, in its general ſenſe, takes in what relates to the nature and union of colours; their agreement or antipathy;

how to uſe them to advantage in light and ſhadow, ſo as to ſhew a relievo in the figures, and a ſinking of the ground. What relates to the aerial perſpective, i. e. the diminution of colours, by means of the interpoſition of air; the various actions and circumſtances of the luminary and the medium; the different lights both of the bodies illuminating, and illuminated; their reflections, ſhadows, different views, either with reſpect to the poſition of the eye, or the object. What produces the ſtrength, fierceneſs, ſweetneſs, &c. in paintings well coloured, is the various manners of Colouring both in figures, landſcapes, &c.

The doctrine of Colouring is compriſed under the following rules:

Colours are conſidered either in reſpect of their uſe, or their œconomy and diſpoſition.

1. In reſpect to their uſe: They are applied either in oil or water; thoſe in oil, again, are conſidered with a view either to their preparation or application.

In the preparation of oil colours, care muſt be taken that they be ground fine; that, in putting them on the pallet, thoſe which will not dry of themſelves be mixed with drying oil or other ingredients of a drying quality, and that the tinged colours be mixed in as ſmall quantities as poſſible.

For their application, it is conſidered either in reſpect to the kinds of painting in works of various colours, or in thoſe of one ſingle colour.

For the firſt, in the larger pieces, the colours are either laid on full, ſo as they may be impaſted, or incorporated together, which makes them hold the more firmly.

Or elſe the more agreeable ones are mixed, which dry too hard and too haſtily, with a little colour, and the cleareſt of the oil; but in both caſes the colours are to be laid on ſtrong at firſt, it being eaſy to weaken thoſe that are to be thruſt back, and to heighten the others; the touches to be bold by the conduct of a free and ſteady pencil, that the work may appear the moſt finiſhed at a proper diſtance, and the figures animated with life and ſpirit.

As to glazed colours, care is to be taken that the under colour be painted ſtrong, and that it be a body colour and laid ſmooth.

In finiſhed works, which are to be viewed near at hand, they proceed either by applying each colour in its place, preſerving their purity without fretting or tormenting them, but ſweetly ſoftening all their extremities; or by filling up all the great parts with one ſingle colour, and laying the other colours which are to form the little things upon it, which is the more expeditious way, but the more apt to decay.

For the ſecond, the kinds of pictures in one colour are two, where

where the degradations of colours of objects afar off are usually managed by lights, as with crayons and basso-relievo; which is an imitation of sculpture of whatsoever matter and colour; in both these the colours are wrought dry.

As for water colours, they are wrought various ways, viz. in distemper, where the colours are prepared in size, which method is used on all kinds of matter, in fresco or painting on fresh mortar; where the Colouring must be quick, that the matter dry not, and with much care and neatness, laying each colour in its place, and intermingling them by parcels.

In agouache, where the colours are mixed with gum, and the pencil dragged as in paintings and washings.

In miniature, for small and delicate works, where the colours are to be very fine and clean, mixed with gums and wrought in dots or points.

But, in all the kinds of painting, both in oil and distemper, especially the latter, care must be taken that the design be fixed, and all the parts marked out, before any colours be applied.

2. But in the second part of Colouring, or the œconomy and dispensing thereof in paintings, regard is had, either first to the quality of the colours, to appropriate them according to their value and agreement; or, secondly, to their effect in the union and œconomy of the work.

As to the first, it must be observed, that white represents light, and gives the briskness and heightening; on the contrary, black, like darkness, obscures and effaces the objects; again, black sets off the light parts, and by that they serve each other to loosen the objects.

A proper choice is to be made of colours, and the too-much charged manner is to be avoided, both in carnations, where red colours are not to be affected, as rather resembling the flesh when dead, than the skin; and all bright glowing colours, the skin, how delicate soever, being of a down-colour.

In the drapery, where the painter has his whole stock of colours to chuse out of to procure a good effect, and in the landscape to dispose of those colours near one another, which mutually assist and raise each other's force and briskness; as red and green, yellow and blue.

To manage them so, as that they be accommodated to the effects of the great parts of light and colour, that the strong colours lead to the soft ones, and make them more looked at; bringing them forwards or keeping them back, according to the situation and degree of force required.

As to the effects of colours, they either have relation to the union or the œconomy; with respect to the first, care must be taken, that they be laid so as to be sweetly united under the brisk-

neſs of ſome principal one; that they participate of the prevailing light of the piece, and that they partake of each other by the communication of light, and the help of reflection.

As for the œconomy in managing their degrees, regard is to be had to the contraſt or oppoſition intervening in the union of the colours; that, by a ſweet interruption, the briſkneſs, which otherwiſe fades and palls, may be raiſed to the harmony which makes the variety of colours agree; ſupplying and ſuſtaining the weakneſs of ſome by the ſtrength of others; neglecting ſome places to ſerve as a baſis or repoſe to the ſight, and to enhance thoſe which are to prevail through the piece.

As to the degradation, where, the better to proportion the colours that fall behind, ſome of the ſame kind are to be preſerved in their purity, as a ſtandard for thoſe carried afar off to be compared by, in order to juſtify the diminution; regard being always had to the quality of the air, which, when loaded with vapours, weakens the colours more than when clear.

As to the ſituation of the colours; in this, care muſt be taken, that the pureſt and the ſtrongeſt be placed before or in the front of the piece; and that the compound ones, which are to appear at a diſtance, be kept back by their force; the glazed colours particularly to be uſed in the firſt rank.

Laſtly, as to the expreſſion of the ſubject, and the nature of the matters or ſtuffs, whether ſhining or dull, opaque or tranſparent, poliſhed or rough.

Colours are to the eye, what ſounds are to the ear, taſtes to the palate, or any other objects of our ſenſes, are to thoſe ſenſes; and, accordingly, an eye that is delicate, takes in proportionable pleaſure from beautiful ones, and is as much offended with their contraries.

Good Colouring therefore in a picture is of conſequence, not only as it is a truer repreſentation of nature, where every thing is beautiful in its kind, but as adminiſtering a good degree of pleaſure to the ſenſe.

The Colouring of a picture muſt be varied according to the ſubject, the time, and place.

If the ſubject be grave, melancholy, or terrible, the general tinct of the Colouring muſt incline to brown, black, or red and gloomy; but you muſt be gay and pleaſant in ſubjects of joy and triumph.

Morning, noon, evening, night, ſun-ſhine, wet or cloudy weather, influences the colours of things; and, if the ſcene of the picture be a room, open air, partly open and partly incloſed, the Colouring muſt be accordingly.

The diſtance alſo alters the Colouring, becauſe of the medium of air through which every thing is ſeen, which being blue, the

more

more remote any object is, the more it muſt partake of that colour, and of conſequence muſt have leſs force or ſtrength; the ground therefore, or whatſoever is behind a figure, for example, muſt not be ſo ſtrong as that figure is, nor any of its parts which round off, as thoſe that come nearer to the eye; and that not only for the reaſon already given, but becauſe there will always be reflections, ſtronger or weaker, that will diminiſh the force of the ſhadows, which reflections, by the way, muſt partake of the colours of thoſe things from whence they are produced.

Any of the ſeveral ſpecies of colours may be as beautiful in their kinds as the others; but one kind is more ſo than another, as having more variety, and conſiſting of colours more pleaſing in their own nature; in which harmony and agreement of one tinct with another, the goodneſs of Colouring conſiſts.

To ſhew the beauty of variety, I will inſtance in a gelder-roſe, which is white, but having many leaves one under another, and lying hollow, ſo as to be ſeen through in ſome places, which occaſions ſeveral tincts of light and ſhadow; and, together with theſe, ſome of the leaves having a greeniſh tinct, all together produces that variety, which gives a beauty not to be found in this paper, though it is white; nor in the inſide of an egg-ſhell, though whiter; nor any other white object, that has not that variety.

And this is the caſe, though this flower be ſeen in a room, in gloomy or wet weather; but let it be expoſed to the open air, when the ſky is ſerene, the blue that thoſe leaves, or parts of leaves that lie open to it, will receive, together with the reflections that then will alſo happen to ſtrike upon it, will give a great addition to its beauty.

But let the ſun-beams touch up its leaves, where they can reach with their fine yellowiſh tinct, the other retaining their ſky blue, together with the ſhadows and briſk reflections it will then receive, and then you will ſee what a perfection of beauty it will have; not only becauſe the colours are more pleaſant in themſelves, but there is greater variety.

A ſky intirely blue would have leſs beauty than it has, were it not always varied towards the horizon, by the ſun-beams, whether riſing, ſetting, or in its progreſs; but neither has it that beauty, as when more varied with clouds, tinged with yellow, white, purple, &c.

A piece of ſilk or cloth, hung or laid flat, has not the beauty, though the colour of it be pleaſing, as when flung into folds; nay, a piece of ſilk that has little beauty in itſelf, may be much improved only by being pinked, watered, or quilted; the reaſon is, in theſe caſes there ariſes a variety produced by lights, ſhades, and reflections.

There are certain colours leſs agreeable than others, as a brick wall, for example; yet, when the ſun ſtrikes upon one part of it, and the ſky tinges another part of it, and the ſhadows and reflections the reſt, this variety ſhall give even that a degree of beauty.

Perfect black and white are diſagreeable, for which reaſon, a painter ſhould break thoſe extremes of colours, that there may be a warmth and mellowneſs in his work; let him, in fleſh eſpecially, remember to avoid the chalk, the brick, and the charcoal, and think of a pearl and a ripe peach.

But it is not enough, that the colours in themſelves are beautiful ſingly, and that there is variety, they muſt be ſet by one another, ſo as to be mutually aſſiſtant to each other; and this not only in the object painted, but in the ground, and whatſoever comes into the compoſition, ſo that as every part, and the whole together, may have a pleaſing effect to the eye, ſuch a harmony to it as a good piece of muſic has to the ear; but for which no certain rules can be given, no more than for the latter, except in ſome few general caſes, which are very obvious, and need not therefore be mentioned here.

The beſt that can be done, is to adviſe one who would know the beauty of Colouring, to obſerve nature, and how the beſt colouriſts have imitated her.

What a lightneſs, thinneſs, and tranſparency, what a warmth, cleanneſs, and delicacy, is to be ſeen in life and good pictures?

He that would be a good colouriſt himſelf, muſt moreover practiſe much, and for a conſiderable time accuſtom himſelf to ſee well-coloured pictures only; but even this will be in vain, unleſs he has a good eye, in the ſenſe as one is ſaid to have a good ear for muſic; he muſt not only ſee well, but have a particular delicacy with relation to the beauty of colours, and the infinite variety of tincts.

The Venetian, Lombard, and Flemiſh ſchools have excelled in Colouring; the Florentine and Roman in deſign; the Bologneſe maſters in both; but not to the degree generally as either of the other.

Correggio, Titian, Paolo Veroneſe, Rubens, and Van Dyke have been admirable colouriſts; the latter, in his beſt things, has followed nature extremely cloſe.

Raphael's Colouring, eſpecially in his ſhadows, is blackiſh. This was occaſioned by the uſe of a ſort of printer's black, and which has changed its tinct, though it was warm and glowing at firſt, upon which account he was fond of it, though he was adviſed what would be the conſequence.

However, by the vaſt progreſs he made in Colouring, after he applied himſelf to it, it is judged, he would in this part of painting alſo have excelled as in the others.

Here

Here would have been a double prodigy! ſince no one man has ever poſſeſſed even Colouring and deſigning, to that or any very conſiderable degree.

Though the cartoons are ſome of the laſt of his works, it muſt be confeſſed, the Colouring of them is not equal to the drawing; but, at the ſame time, neither can it be denied, but that he that painted thoſe, could colour well, and would have coloured better.

It muſt be conſidered, they were made for patterns for tapeſtry, not profeſſed pictures, and painted not in oil, but in diſtemper; if therefore one ſees not the warmth and mellowneſs, and delicacy of Colouring, which is to be found in Correggio, Titian, or Rubens, it may be in a meaſure fairly imputed to theſe cauſes.

A judicious painter has other conſiderations relating to the Colouring, when he makes patterns for tapeſtry to be heightened with gold and ſilver, than when he paints a picture, without any ſuch view; nor can a ſort of dryneſs and harſhneſs be avoided in diſtemper upon paper.

Beſides, time has apparently changed ſome of the colours.

In a word, the tout enſemble of the colours is agreeable and noble, and the parts of it are in general extremely, though not ſuperlatively good.

I will only add one obſervation here, concerning the colours of the draperies of the Apoſtles, which are always the ſame in all the cartoons; only St. Peter, when he is a fiſherman, has not his large apoſtolical drapery on.

This Apoſtle, when dreſſed, wears a yellow drapery over his blue coat; St. John, a red one over a green; ſo does St. Paul, which is alſo the ſame which he wears in the famous St. Cecilia, which was painted near ten years before.

The various forms and degrees of COLOURING.

There are four various forms or degrees of Colouring, viz.

1. Of infants or children.
2. Of virgins or fair women.
3. Naked bodies.
4. Old or aged bodies.

1. Infants or young children are to be painted of a ſoft and delicate complexion, the ſkins and ears of a ruddy and pleaſant colour, almoſt tranſparent. This may be done with white lead, lake, and a little red lead, ſhadowing it thin, faint and ſoft, letting the cheeks, lips, chin, fingers, knees, and toes, be more ruddy than the other parts; making all their linen very fine, thin, and tranſparent, or perſpicuous, with ſtrong touches in the thickeſt folds.

2. Virgins and fair women are as curiouſly to be expreſſed as the former, but their muſcles ought to appear more plainly;

their ſhapes more perfect, and their ſhadows to be of a whitiſh yellow, bluiſh, and in ſome places almoſt purple. But the moſt perfect and exquiſite direction is the life, which ought rather to be followed, than any thing delivered by rule. For the ſhadows here, mix white with pink, and indigo and white; and in ſome places lake, with a little indigo and white. As for women's bodies, viz. ſuch as are naked, they are to be repreſented ſoft, round, plump, gentle, and tender, and without muſcles. On the contrary, the bodies of men are to be repreſented ſtrong, ſturdy, ſtout, and vigorous, with the muſcles exactly placed and ſtrong; which, to do with judgment and underſtanding, requires time, ſtudy, and knowledge in anatomy.

3. Naked bodies are to be painted ſtrong, lively, and accurate, exactly matching the reſpective pairs of muſcles and nerves, fixing each artery in its due and proper place, giving each limb its proper motion, form, and ſituation, with its true and natural colour; all which to do well may be the ſtudy and practice of almoſt one's whole life.

4. Old or aged bodies ought to be eminent for exact and curious ſhadows, which may be made of pink, lake, and ivory-black, which make very proper ſhadows in appearance, like the wrinkles and furrows of the face and hands in extreme old age. Let the eyes be dark, the aſpect melancholy, and hair white, or elſe the pate bald, and all the remarks of antiquity or age be very apparent. Pink mixed with lake and red lead make an excellent ſhadow for the bodies of old men; but, for the extremeſt or deepeſt ſhadows, either in face or body, mix lake and ivory-black, which will make an excellent deep ſhadow, and will be very uſeful in expreſſing the ſeveral furrows and wrinkles in the face and hands of very old people, with their dark eyes and melancholy aſpects.

But, notwithſtanding all the foregoing rules, the poſture or form of ſtanding, and being, either of the whole body or any of its parts, ought to be diligently obſerved, that the life may be imitated.

COMELINESS, is repreſented, in painting, &c. by a beautiful nymph of a graceful aſpect in changeable taffety; on her girdle is embroidered a Cupid, and Mercury's rod, holding the corn marigold in her right hand, and the bird wagtail in her left.

COMMERCE, is repreſented, in painting, &c. by a man with his fore-finger pointing to two mill-ſtones ſtanding by him; a ſtork on his right arm, and a buck at his feet. The two mill-ſtones denote action and Commerce, for, being double, the one can do nothing without the other, nor grind any corn alone. The ſtorks help one another in flying, and the bucks in ſwimming.

COMMONWEALTH, is repreſented, in painting, by a lady reſembling Minerva, holding an olive-branch in one hand, and

and a ſhield; and in the other a javelin, with a helmet on her head. Her deportment, like Minerva, ſhews that wiſdom is the principle of good government; the helmet, that the republic ought to be well fortified, and ſecured from foreign force. The olive and dart, that peace and war are both beneficial to the Commonwealth; war, becauſe by experience valour is attained; peace, becauſe by leiſure prudence to govern is acquired.

COMPASSION. The lively attention to the misfortunes of others, which is called Compaſſion, cauſes the eye-brows to ſink towards the middle of the forehead; the eye-ball to be fixed upon the object; the ſides of the noſtrils next the noſe to be a little elevated, making wrinkles in the cheeks; the mouth to be open; the upper lip to be lifted up, and thruſt forwards; the muſcles and all the parts of the face ſinking down and turning towards the object, which cauſes the paſſion. And by theſe expreſſions it is to be repreſented in drawing. See plate III.

COMPASSION is repreſented, in painting, &c. by a woman holding a pelican's neſt in her left hand, who, piercing her breaſt, ſeems to ſuckle her young ones with her blood; ſhe extends her hand in a compaſſionate manner to beſtow charity on the indigent. The pelican is a true emblem of Compaſſion, for ſhe is ſaid never to ſtir from her young, and, when her nouriſhment fails, ſhe feeds them with her own blood. Her extended hand denotes her readineſs to relieve with her own ſubſtance.

COMPLAINT *to God*, is repreſented, in painting, &c. by a woman cloathed in a white veil, of a ſorrowful countenance, looking up to heaven; laying one hand upon her breaſts, ſhewing the other bitten by ſerpents. Her cheeks, bathed in tears, demonſtrate her Complaint; her looks, that ſhe directs her Complaint to God; her hands denote the reaſon of her Complaint to be ſome offence, ſignified by the ſerpent; her white raiment, and hand upon her breaſt, denote innocence.

COMPOSITION, is putting together, for the advantage of the whole, what ſhall be judged proper to be the ſeveral parts of a picture; either as being eſſential to it, or becauſe they are thought neceſſary for the common benefit: And, moreover, the determination of the painter, as to certain attitudes and colours, which are otherwiſe indifferent.

The Compoſition of a picture is of vaſt conſequence to the goodneſs of it; it is what firſt of all preſents itſelf to the eye, and prejudices us in favour of, or with an averſion to it; it is this that directs us to the ideas that are to be conveyed by the painter, and in what order; and the eye is delighted with the harmony at the ſame time as the underſtanding is improved. Whereas, this being ill, though the ſeveral parts are fine, the picture is troubleſome to look upon, and like a book, in which are many good thoughts, but flung in confuſedly, and without method.

Every

Every picture ſhould be ſo contrived, as that at a diſtance, when one cannot diſcern what figures there are, or what they are doing, it ſhould appear to be compoſed of maſſes light and dark; the latter of which ſerve as repoſes to the eye. The forms of theſe maſſes muſt be agreeable, of whatever they conſiſt, ground, trees, draperies, figures, &c. and the whole together ſhould be ſweet and delightful, lovely ſhapes and colours, without a name; of which there is an infinite variety.

And it is not enough that there be great maſſes; they muſt be ſubdivided into leſſer parts, or they will appear heavy and diſagreeable. Thus, though there is evidently a broad light (for example) in a piece of ſilk, when covering a whole figure, or a limb, there may be leſſer folds, breakings, flickerings, and reflections, and the great maſs yet evidently preſerved.

Sometimes one maſs of light is upon a dark ground, and then the extremities of the light muſt not be too near the edges of the picture, and its greateſt ſtrength muſt be towards the center; as in the deſcent from the croſs, and the dead Chriſt, both of Rubens, and of both which there are prints, one by Voſterman, and the other by Pontius.

There is a painting of the holy family, by Rubens, of this ſtructure; where, becauſe the maſs of light, in one part, would elſe have gone off too abruptly, and have made a leſs pleaſing figure, he has ſet the foot of St. Eliſabeth on a little ſtool: Here the light catches, and ſpreads the maſs ſo as to have the deſired effect. Such another artifice Raphael has uſed in a madonna; he has brought in a kind of an ornament to a chair, for no other end (as may be imagined) but to form the maſs agreeably.

Van Dyke, that he might keep his principal light near the middle of his picture, and to advantage the body which he ſeems to have intended to exert himſelf in, has even kept the head ſombrous in an ecce homo, and makes the whole have a fine effect.

The ſame author ſays, he has many times obſerved with a great deal of pleaſure the admirable Compoſition (beſides the other excellencies) of a fruit-tree of Michael Angelo Campadoglio. The principal light is near the center (not exactly there, for thoſe regularities have an ill effect) and the tranſition from thence, and from one thing to another, to the extremities of the picture all round, is very eaſy and delightful; in which he has employed fine artifices by leaves, twigs, little touches of lights ſtriking advantageouſly, and the like. So that there is not a ſtroke in the picture without its meaning; and the whole, though very bright, and conſiſting of a great many parts, has a wonderful harmony and repoſe.

Sometimes the ſtructure of a picture, or the tout-enſemble of its

its form, ſhall reſemble dark clouds on a light ground; as in two aſſumptions of the Virgin by Bolſwert, after Rubens. Le Brun, in a cieling of the ſame ſubject, graved by young Simconneau, has put a group of angels, which almoſt hide the cloudy voiture of the Virgin; but this maſs is of too regular and heavy a ſhape.

There are inſtances where two maſſes, a light and a dark one, divide the picture, each poſſeſſing one ſide. Of this ſort is one done by Rubens, and as fine a Compoſition as can be ſeen; the maſſes are ſo well rounded, the principal light being near the middle of the bright one, and the other having ſubordinate lights upon it, ſo as to connect, but not to confound it with the reſt; and they are in agreeable ſhapes, and melting into one another, but nevertheleſs ſufficiently determined.

Very commonly a picture conſiſts of a maſs of light, and another of ſhadow upon a ground of a middle tinct. And ſometimes it is compoſed of a maſs of dark at the bottom, another lighter above that, and another for the upper part ſtill lighter; (as uſually in a landſcape) ſometimes the dark maſs employs one ſide of the picture alſo. As a certain copy after Paolo Veroneſe, where is a large group of figures, the principal ones of the ſtory compoſe this lower brown maſs; architecture, the ſecond; more buildings, with figures and the ſky, the third; but moſt commonly, in pictures of three maſſes, the ſecond is the place of the principal figures.

Of ſuch conſequence are theſe agreeable maſſes in a picture, that, for the ſake of them, what is leſs material in a picture, muſt be diſpenſed with, when both cannot be had. As the principal figure and action muſt be diſtinguiſhed, thoſe limbs of a figure that are chiefly employed, ought to be made conſpicuous.

As the tout-enſemble of a picture muſt be beautiful in its maſſes, ſo muſt it be as to its colours. And, as what is principal muſt be (generally ſpeaking) the moſt conſpicuous, the predominant colours of that ſhould be diffuſed throughout the whole. This Raphael has remarkably obſerved in the cartoon of St. Paul preaching; his drapery is red and green, and theſe colours are ſcattered every-where, but judiciouſly; for ſubordinate colours, as well as ſubordinate lights, ſerve to ſoften and ſupport the principal ones, which otherwiſe would appear as ſpots, and conſequently be offenſive.

And when the ſubject does not neceſſarily require a due variety or beauty of tincts; or perhaps the picture, when thought to be finiſhed, is found to want ſomething of this kind; a few red, or yellow leaves of trees, flowers of whatever colour, in ſhort, any thing otherwiſe indifferent, may be flung in very advantageouſly.

In a figure, and every part of a figure, and indeed in every

thing elſe, there is one part which muſt have a peculiar force, and be manifeſtly diſtinguiſhed from the reſt, all the other parts of which muſt alſo have a due ſubordination to it, and to one another. The ſame muſt be obſerved in the Compoſition of an intire picture; and this principal, diſtinguiſhed part ought (generally ſpeaking) to be the place of the principal figure and action: And here every thing muſt be higher finiſhed; the other parts muſt be leſs ſo, gradually.

In the deſcent from the croſs of Rubens, the Chriſt is the principal figure. This body being naked, and about the center of the picture, would have been diſtinguiſhed as the heightening of this maſs of light; but, not content with that, and to raiſe it ſtill more, this judicious maſter has added a ſheet, in which the body is, and which is ſuppoſed to be uſeful to deliver it down ſafely, as well as to carry it off afterwards; but the main deſign is what I am obſerving, and for that it is admirably introduced.

Ananias is the principal figure in the cartoon, which gives the hiſtory of his death, as the Apoſtle that pronounces his ſentence, is of the ſubordinate group, which conſiſts of Apoſtles, (which therefore is ſubordinate, becauſe the principal action relates to the criminal, and thither the eye is directed by almoſt all the figures in the picture.) St. Paul is the chief figure in that cartoon, where he is preaching; and, amongſt his auditors, one is eminently diſtinguiſhed, who is principal of that group, and is apparently a believer, and more ſo than any of them, or he had not had that ſecond place in a picture conducted by ſo great a judgment, as that of Raphael's.

Theſe principal and ſubordinate groups and figures are ſo apparent, that the eye will naturally fix firſt upon one, then upon the other, and conſider each in order, and with delight. Where it is not thus, the Compoſition is leſs perfect.

It is to be noted, that the ſorcerer, in the cartoon of his chaſtiſement, is the principal figure there, but has not the force in all its parts as it ought to have as ſuch, and to maintain the harmony. This is accidental, for it is certain his drapery was of the ſame ſtrength and beauty, as that on his head; however it has happened to have changed its colour.

The ſhadows in the drapery of St. Paul alſo, in that cartoon, where the people are about to ſacrifice to him and Barnabas, have loſt ſomething of their force.

Sometimes the place in the picture, and not the force, gives the diſtinction; and ſometimes the painter happens to be obliged to put a figure in a place, and with a degree of force which does not ſufficiently diſtinguiſh it. In that caſe, the attention muſt be awakened by the colour of its drapery, or a part of it, or by the ground on which it is painted, or ſome other artifice.

Scarlet

Scarlet or ſome vivid colour is very proper on ſuch occaſions. In a picture of Albano, which Sir James Thornhill had, our Lord is ſeen at a diſtance, as coming towards ſome of his diſciples; and, though a ſmall figure is nevertheleſs the moſt apparent in the picture by being placed on a riſing ground, and painted upon a bright part of the ſky juſt above the horizon.

In a Compoſition, as well as in every ſingle figure, or other part of which the picture conſiſts, one thing muſt contraſt, or be varied from another. Thus, in a figure, the arms and legs muſt not be placed to anſwer one another in parallel lines. In like manner, if one figure in a Compoſition ſtands, another muſt bend, or lie on the ground; and of thoſe that ſtand, or are in any other poſition, if there be ſeveral of them, they muſt be varied by turns of the head, or ſome other artful diſpoſition of their parts, as may be ſeen (for inſtance) in the cartoon of giving the keys. The maſſes muſt alſo have the like contraſt, two muſt not be alike in form or ſize, nor the whole maſs compoſed of thoſe leſſer ones of too regular a ſhape. The colours muſt be alſo contraſted and oppoſed, ſo as to be grateful to the eye. There muſt not (for example) be two draperies in one picture of the ſame colour and ſtrength, unleſs they are contiguous, and then they are but as one. If there be two reds, blues, or whatever other colour, one muſt be of a darker or paler tinct, or be ſome way varied by lights, ſhadows, or reflections. Raphael, and others, have made great advantage of changeable ſilks to unite the contraſting colours, as well as to make a part of the contraſt themſelves. As, in the cartoon of giving the keys, the Apoſtle that ſtands in profile, and immediately behind St. John, has a yellow garment with red ſleeves, which connects that figure with St. Peter and St. John, whoſe draperies are of the ſame ſpecies of colours. Then the ſame anonymous Apoſtle has a looſe changeable drapery, the lights of which are a mixture of red and yellow, the other parts are bluiſh. This unites itſelf with the other colours already mentioned, and with the blue drapery of another Apoſtle which follows afterwards; between which, and the changeable ſilk, is a yellow drapery, ſomething different from the other yellows, but with ſhadows bearing upon the purple, as thoſe of the yellow drapery of St. Peter incline to the red. All which, together with ſeveral other particulars, produce a wonderful harmony.

The exotic birds that are placed on the ſhore, in the foreground in the cartoon of the draught of fiſhes, prevent the heavineſs, which that part would otherwiſe have had, by breaking the parallel lines, which would have been made by the boats, and baſe of the picture.

Though a maſs may conſiſt of a number of little parts, there ought

ought to be one, or more, larger, and, as it were, governing the reſt, and this is another ſort of contraſt. The good Samaritan, by Baſſau, is a fine inſtance of this. In the ſame picture, there are two knees of two ſeveral figures, pretty near together, and the legs and thighs of which make angles too much alike; but this is contraſted by one being naked, and the other clad; and over the latter a little ſort of ſaſh falls, which is an additional expedient.

There is an admirable contraſt in the cartoon of St. Paul preaching. His figure (which is a rare one) ſtands alone as he ought to do, and conſequently is very conſpicuous, which is alſo perfectly right. The attitude is as fine as can be imagined; but the beauty of this noble figure, and with it of the whole picture, depends upon this artful contraſt I have been ſpeaking of; of ſo great conſequence is that little part of the drapery flung over the Apoſtle's ſhoulder, and hanging down almoſt to his waiſt; for (beſides that it poiſes the figure, which otherwiſe would have ſeemed to have tumbled forwards) had it gone lower, ſo as to have as it were divided the outline of the hinder parts of the figure in two equal, or near equal parts, it had been offenſive; as it had been leſs pleaſing, if it had not come ſo low as it does. This important piece of drapery preſerves the maſs of light upon that figure, but varies it, and gives it an agreeable form; whereas, without it, the whole figure would have been heavy and diſagreeable: But there was no danger of that in Raphael.

The naked boys, in the cartoon of healing the cripple, are a farther proof of Raphael's great judgment in Compoſition. One of them is in ſuch an attitude as finely varies the turns of the figures; but here is moreover another kind of contraſt, and that is cauſed by their being naked, which, how odd ſoever it may ſeem at firſt, and without conſidering the reaſon of it, will be found to have a marvellous effect. Cloath them in imagination; dreſs them as you will, the picture ſuffers by it, and would have ſuffered, if Raphael himſelf had done it.

It is for the ſake of this contraſt, which is of ſo great conſequence in painting, that this knowing man, in the cartoon we are now upon, has placed his figures at one end of the temple, near the corner, where one would not ſuppoſe the beautiful gate was. But this varies the ſides of the picture, and at the ſame time gives him an opportunity to enlarge his buildings with a fine portico, the like of which you muſt imagine muſt be on the other ſide of the main ſtructure; all which together makes one of the nobleſt pieces of architecture that can be conceived.

He has taken a greater licence in the cartoon of the converſion of Sergius Paulus, where the architecture will be difficult to account for, otherwiſe than by ſaying, it was done to give

he contraſt we are ſpeaking of. But this will juſtify its ſufficiently.

Nor is this contraſt only neceſſary in every particular picture; but, if ſeveral are made to hang in one room, they ought to contraſt one another.

The maſters to be ſtudied for Compoſition are Raphael, Rubens, and Rembrandt, moſt eſpecially, though many others are worthy notice, and to be carefully conſidered; amongſt which, V. Velde ought not to be forgotten, who, though his ſubjects were ſhips, which, conſiſting of ſo many little parts, are very difficult to fling into great maſſes, has done it by the help of ſpread ſails, ſmoak, and the bodies of the veſſels, and a judicious management of light and ſhadows. So that his Compoſitions are many times as good as thoſe of any maſter.

CONCORD, is repreſented, in painting, &c. by a grave beautiful lady in an antique dreſs, holding in her right hand a baſon with a heart, and pomegranate in it, and a garland of fruits and flowers on her head, and in her left a ſcepter; on the top of which are various flowers and fruits. The heart and pomegranate denote Concord, becauſe the pomegranate is full of little grains cloſely united, to that degree, that, if the roots be ſeparated, they mutually twiſt together again.

Concord is alſo repreſented, in painting, as a lady in a ſky-coloured robe, and a yellow mantle, holding in her right hand a charger for ſacrifice, and, in her left, a cornucopia, with the word Concordia, or thus: As a fair virgin, holding in one hand a pomegranate, and in the other a bunch of myrtle. The reaſon of which is, that the nature of theſe trees is ſuch, that, if they are planted, although at a good ſpace from one another, they will meet, and with twining embrace one another.

CONFIDENCE, is repreſented, in painting, &c. by a woman, with her hair hanging about her ears, bearing up a ſhip with both her hands. The ſhip ſhews that, although the ſea be terrible, yet ſhe is confident that, by the help of this ſhip, ſhe may truſt herſelf with that barbarous element, threatening ruin and deſtruction.

CONJUGAL *Love*, is repreſented, in painting, &c. by a man at a woman's right hand, both clad in purple; one gold chain incircles both their necks, having a heart for a pendant, ſupported only by one hand of each. The chain denotes matrimony, ordained by nature and the divine law, which would have the huſband and wife to be one fleſh and bone, not to be ſeparated but by death.

CONNOISSANCE, in painting, is a ſkill in that particular ſcience. See CONNOISSEUR.

CONNOISSEUR. It is not enough, ſays Mr. Richardſon,

to be an ingenious man in general, nor to have ſeen all the fineſt things in Europe, nor even to be able to make a good picture, much leſs the having the names and ſomething of the hiſtory of the maſters; all this will not render a man a good Connoiſſeur, to be able to judge of the goodneſs of a picture; moſt of thoſe qualifications are neceſſary, which the painter himſelf ought to be poſſeſſed of, that is, all that are not practical: He muſt be maſter of the ſubject, and, if it be improveable, he muſt know it to be ſo, and wherein; he muſt not only ſee and judge of the painter, in what he has done, but muſt know, moreover, what he ought to have done; he muſt be acquainted with the paſſions, their nature, and how they appear on all occaſions.

He muſt have a delicacy of eye, to judge of harmony and proportion of beauty of colours and accuracy of hand; and, laſtly, he muſt be converſant with the better ſort of people, and with the antique, or he will not be a good judge of grace and greatneſs: And he muſt have not only a ſolid, but an unbiaſſed judgment.

The knowledge of hiſtory is abſolutely neceſſary to a Connoiſſeur, not only that which may enable him to judge how well the painter has managed ſuch and ſuch a ſtory, which he will have frequent occaſion to do; but the particular hiſtory of the arts, and eſpecially of painting.

CONSCIENCE, is repreſented, in painting, &c. by a lady with a heart in her hand before her eyes, where is written, in letters of gold, ΟΙΚΕΙΑ ΣΥΝΕΣΙΣ, that is, one's own Conſcience, ſtanding on her legs, between a flowery meadow and a field full of thorns and briars. The heart ſhews that none can be hid from himſelf; the flowers and thorns, that there are two ways, good and bad, the part of Conſcience is to chuſe: In the one, we meet the prickings of vice; in the other, the fragrant ſmell of virtue.

CONSTANCY, is repreſented, in painting, &c. by a woman, embracing a pillar with her right arm, and holding a drawn ſword, in her left hand, over a fire on the altar, as if ſhe had a mind to burn her arm and hand. The column ſhews her ſtedfaſt reſolution not to be overcome; the naked ſword, that neither fire nor ſword can terrify courage armed with Conſtancy.

CONTAGION, is repreſented, in painting, &c. by a young maid in a mournful pitiful habit; ſhe holds a walnut branch in one hand, and lays the other on a baſiliſk with a terrible aſpect; on the other ſide is a ſtripling, languid and ſickly, lying half dead upon the ground. Young, becauſe more ſubject to infection by diſorderly living and careleſſneſs; pale and languid denotes the virulency conſuming, by degrees; the habit, the doleful condition of the infected ending often in death; the bough de-

notes Contagion, as does the baſiliſk, whoſe very breath and looks are contagious.

CONTENTMENT, is repreſented, in painting, &c. by a ſpark pompouſly adorned, with a ſword by his ſide; the ornaments on his head are a plume of feathers and jewels; a looking-glaſs in one hand, and in the other a ſilver baſon, clapped to his thigh, full of money and jewels. He, looking in the glaſs, ſhews that, if a man be ignorant of his own good, he cannot be content; who therefore looks upon his own fine cloaths, money, and jewels, with much ſatisfaction and content.

CONTOUR, in painting, &c. the outline, or that which terminates and defines a figure.

A great part of the ſkill of the painter conſiſts in managing the Contours well. The Contour of a figure makes what we call the draught or deſign. The Italian painters ordinarily call the lineaments of the face the Contour of it.

CONTRAST, in painting and ſculpture, expreſſes an oppoſition, or difference of poſition, attitude, &c. of two or more figures, contrived to make a variety in a painting. Thus, when, in a group of three figures, one is ſhewn before, another behind, and a third ſideways, there is ſaid to be a Contraſt.

M. de Piles defines Contraſt, an oppoſition between the lines, which form objects, by means whereof they ſet off one the other.

A Contraſt, well managed, is one of the greateſt beauties of a painting. It is not only to be obſerved in the poſition of ſeveral figures, but alſo in that of the ſeveral members of the ſame figure; thus, if the right arm advance the fartheſt, the right leg is to be hindmoſt; if the eye be directed one way, the arm to go the contrary way, &c. The Contraſt alſo muſt be purſued even in the drapery.

CONVERSATION, is repreſented, in painting, &c. by a young man, with a ſmiling countenance, cloathed in green, a laurel garland on his head, a Mercury's rod in his hand, twiſted about with a myrtle and pomegranate, and a human tongue at the top, with a ſcrowl, on which is written Væ ſoli. His poſture ſhews him inclined to entertain ſomebody; the ſcrowl, Woe to him that is alone; the two branches ſhew mutual amity by Converſation; the tongue expreſſeth the mind in company.

CONVERSION, is repreſented, in painting, &c. by a naked lady, at years of diſcretion, holding a green ribbon, inſcribed, In te Domine ſperavi; on the ground are ſplendid garments; ſhe looks up to heaven, whence proceeds a ray; ſhe is bathed in tears, her hands a-croſs, a hydra at her feet gaping. Fair denotes Converſion to God; her years, her being averſe from all exceſſes; her nakedneſs, purity; and deſpoiled of all worldly affections, by her rich garments upon the ground.

Henry COOK, was an Engliſh gentleman and hiſtory-painter; he was not only a great critic in painting, but alſo a good performer, as appears in many public pieces of his, viz. the altar-piece at New College chapel in Oxford, and what he has done at Chelſea, at Hampton-Court, and on many cielings and ſtair-caſes in this kingdom. He painted many fine copies of the cartoons of Raphael, &c. which are particularly remarkable, being drawn in turpentine-oil, after the manner of diſtemper, of which he is ſaid to have been the inventor. He died in London, November 18, 1700, aged near fifty-eight, and lies buried in St. Giles's church.

Mr. Samuel COOPER, born in the year 1609, a ſcholar of Mr. Hoſkins, and ſtudied Van Dyke; he lived at London, excelled in portraits and miniature; died in the year 1672, aged ſixty-three years. His pencil was generally confined to a head only, and indeed, below that part, he was not always ſo ſucceſsful as could be wiſhed; but, for a face and all the dependencies of it, viz. the graceful and becoming air, the ſtrength, relievo, and noble ſpirit, the ſoftneſs and tender livelineſs of fleſh and blood, and the looſe and genteel management of the hair, his talent was ſo extraordinary; and, for the honour of our nation, it may without vanity be affirmed, he was, at leaſt, equal to the moſt famous Italians, and that hardly one of his predeceſſors has ever been able to ſhew ſuch perfection in ſo narrow a compaſs; he died anno 1672, ætat. 63, and lies buried at Pancras church.

Alexander COOPER, was the elder brother of Samuel Cooper; he performed well in miniature, and, going abroad, became limner to Chriſtiana, queen of Sweden; yet was far exceeded by his brother Samuel, who was much the greater maſter. He did likewiſe a landſcape, in water colours, exceeding well, and was accounted an extraordinary draughtſman.

COPAL. A gum of an agreeable ſmell, reſembling that of incenſe, brought from New Spain, where it oozes out from inciſions made in the bark of a large tree, much after the manner in which the vine yields its water, when cut in the ſpring.

It is very rare, when good; it is of a fine tranſparent yellow, and melts eaſily.

For want of this, there is another kind brought from the Antilles, which is almoſt the only one known among the druggiſts. Its chief conſumption is in making varniſh.

Of the choice of COPIES. 1. In chuſing a pattern, to draw by, you ought to obſerve, firſt, that it be well deſigned; ſecondly, that it be well covered.

2. As to the well deſigning, ſee that it be true in every part, and that the proportion of the figure be juſt and anſwer to the life.

3. If

3. If the picture be a fiction, ſee that it be done boldly, not only to exceed the work, but alſo the poſſibility, of nature, as in centaurs, ſatyrs, ſyrens, flying horſes, ſea-horſes, tritons, nereids, &c.

4. Natural figures ſhew property, and are required to agree with the life; forced figures expreſs novelty, and are to be beautified by exorbitancies, according to the fancy of the painter, without limitation; novelty cauſes admiration, and admiration, curioſity, and a kind of delight and ſatisfaction.

In the well-colouring, know that, in obſcurity or darkneſs, there is a kind of deepneſs; the ſight being ſweetly deceived, gradually, in breaking the colours, by inſenſible change from the more high to the more dull.

In the rainbow this mixture is perfect; the variety of colours are thoroughly diſperſed, like atoms in the ſun-beams, among one another, to create its juſt appearance.

See that the ſwellings of the work agree to the exactneſs of nature, and as the parts thereof require, without ſharpneſs in outlines, or flatneſs within the body of the piece.

As alſo, that each hollowneſs exactly correſponds to due proportions.

Laſtly, view with attention the paſſions, as joy, ſorrow, love, hatred, fear, hope, &c. and ſee that they correſpond with their proper poſtures; for a touch of the pencil may ſtrangely alter a paſſion to its juſt oppoſite or contrary, as from mirth to mourning, &c.

COPPER, a hard, dry, heavy, ductile metal, found in mines, in ſeveral parts of Europe, but moſt abundantly in Sweden.

Copper is, of all metals, the moſt ductile and malleable, after gold and ſilver.

By an analyſis, it appears to be compoſed of a ſulphur ill digeſted, a yellowiſh mercury, and a red ſalt.

It is found both in duſt and in ſtones; each of which are firſt well waſhed, to ſeparate them from the earth, wherewith they are mixed. In this ſtate it is called virgin Copper.

After it has been waſhed, it is melted, and the melted matter is run into a kind of moulds, to form large blocks, by ſome called ſalmons, and, by others, pigs of Copper.

In order to render it more pure and beautiful, they melt it again once or twice, ſome of its coarſe earthy parts being left each fuſion, and a quantity of tin and antimony added in each. In this ſtate it is called roſe Copper.

Of a mixture of this and lapis calaminaris is formed braſs.

Copper melted, together with twenty-two or twenty-three pounds of fine tin per quintal, makes bell-metal.

Copper, melted with calamine, quantity for quantity, makes braſs.

Copper and braſs, melted in equal quantities, make what the French call bronze, uſed for figures, ſtatues, &c.

Copper turns white, by an unction of ſpirit of wine and orpiment.

Pliny ſays there is a Copper, naturally white, found underneath the ſilver mines.

The uſe of Copper is very extenſive; among other works of Copper may be reckoned thoſe of braſs, bell-metal, pot-metal, &c. which are all compoſitions, where Copper makes the prevailing ingredient.

To blanch COPPER. Take arſenic eight ounces, ſal nitre and white tartar, of each two ounces, borax one ounce; reduce them to fine powder, cement the copper therewith, by laying thin plates, layer upon layer; after forty-eight hours of a cementing heat (the crucible being ſtrong, well ſtopped, covered, and ſtrongly luted) increaſe the fire, and cauſe it all to melt down together.

Another way to do the ſame. Take white-wine vinegar and ſtrong ley made of wood-aſhes, ſo ſtrong as to bear an egg, of each four pounds; ſulphur and hogs blood, of each one pound; powder the ſulphur, mix all together, and digeſt in an earthen pot cloſe covered for eight days, then ſtrain it.

2. Take eight pounds of Copper, melt and quench it in the aforeſaid ley; do this four times, and then will the Copper be in a meaſure prepared.

3. Take white arſenic and ſheeps ſuet tied up, of each a pound; white lead, four ounces; put them all together in a kettle, keeping continually ſtirring them, till they boil to a powder, which keep for uſe.

4. Take the Copper before prepared, and melt it again a fifth time, to which put a little of your prepared powder of arſenic, by little and little at a time, the Copper being firſt melted, ſtirring it with a wooden ſtick till it is diſſolved in the metal; then caſt it into an ingot.

The former powder will ſerve for eight pounds of Copper.

To fix ſal armoniac for this work. 1. Take ſal armoniac, ſublimed to a perfect whiteneſs; put it into a glaſs alembic, with a head and receiver, caſting, upon the ſal armoniac, ſome good diſtilled vinegar, ſo as to cover it a hand's-breadth, and diſtil it with a ſoft fire.

2. Then put upon it more freſh vinegar, and diſtil again; repeat this till the ſal armoniac remains in the bottom, afterwards let the fire go out of itſelf, and keep the oil cloſe ſtopped for uſe.

3. If you take mercury two ounces, and make it hot in the fire, then drop on it three drops of the oil, and the mercury will be congealed into a pure metal; of this, one part will make ten parts

parts of Copper, as fair as ſilver, the ten parts of Copper being firſt melted, and the mercury one part being caſt upon it.

To fix arſenic. Take a ſtrong ley of aſhes and quick-lime, filtre it, and diſſolve arſenic with it; then evaporate the humidity by boiling, and the arſenic will be prepared and fixed.

To whiten COPPER *or braſs ſuperficially.* Take ſal armoniac, alum, and nitre of each a like quantity; put them to a little filings of ſilver refined, or leaf ſilver; mix them well together, and put it into the fire, till it be red-hot, in a crucible, and till it has done ſmoaking; then moiſten this powder with ſpittle, and rub either Copper or braſs with it, and it will be white.

To whiten COPPER *or iron.* Take calx of ſilver, grind it with two parts of calcined precipitate of arſenic, and one part of white precipitate mercury; imbibe them with water, made of ſal nitre, ſal armoniac, and litharge, of each equal parts, and this till they have drunk up their weight of the water; put one part of it on four parts of prepared Copper or iron.

COPPER, *to calcine to a red powder, which ſerves in ſeveral proceſſes for colouring glaſs.* Although copper be of the ſame nature as braſs, which ſerves to colour glaſs blue, yet there is ſome difference between them; for the latter will tinge it of ſeveral colours, which proceeds from the lapis calaminaris, and ſome other mixtures in the preparation.

To make this powder, take copper in thin plates, what quantity you pleaſe; put it into a large crucible, and ſet it in a furnace till it be calcined, without melting; then, being cooled, reduce it into powder, which will be very red, and ſearce it; of this divers uſes may be made, as will be ſhewn in many places.

To calcine COPPER *thrice, for colouring glaſs.* The ſame red powder, in the preceding paragraph, ſerves here.

Lay that powder on tiles, and calcine it again in the furnace for four days, and it will become black, and coagulated into one maſs.

Reduce it to a powder, and ſearce it; calcine it again for five or ſix days in the ſame furnace, and it will become grey, without coagulating any more, or running into lumps, and will be in a condition fit to be diſſolved.

This powder the Italians call ramina di trecotte; and of it is made a ſky-coloured blue, the colour of turquoiſe, the green of emerald, and ſeveral other colours.

It muſt not be calcined above three times, becauſe it would no longer colour glaſs.

It may be known whether it be calcined well, by caſting ſome of it into a pot of boiling glaſs; if it ſwells, it is enough; if not, it muſt be ſet again into the furnace for twenty-four hours, or rather begin a new proceſs.

An eaſier and leſs chargeable way of making thrice calcined COPPER. This, as it is leſs expenſive, will alſo be almoſt equal in beauty.

Take ſcales, made by braziers in making pots, kettles, and other works of braſs, which is cheaper by far than new Copper.

Theſe ſcales need not be ſtratified, like the Copper before-mentioned, which is troubleſome; there is no need of any thing but to waſh them from all filth, to dry them well, to put them into one or more crucibles, and to ſet them into the mouth of a reverberatory furnace for the ſpace of four days: Then, being at length cooled, they are to be pounded, or ground and ſearced.

Then the powder is to be ſet a ſecond time into the ſame furnace to reverberate for four days more, and you will have little balls of a black colour, which muſt be pounded and ſearced again, and then put the third time into the reverberatory; then, after four other days, reduce them to a powder as before.

Thus will it be prepared with leſs expence, and as good for colouring of glaſs; which may be known very eaſily, by making a trial of it on melted glaſs; for, if it makes it riſe when you caſt it on, it is right.

To ſoften COPPER. Melt burnt braſs in a crucible, with borax, quench it in linſeed oil, and then beat it gently on an anvil; then boil it again, and quench it in oil as before, doing this five or ſix times till it is ſoft enough; and this will neatly unite with gold, of which you may put in more by half than you can of other braſs.

COPPER-*Green*; an excellent green, or rather blue-green colour, much uſed in waſhing prints.—It is made in the following manner: Take a pound of right French verdigreaſe made at Montpelier, that being the beſt; becauſe the verdigreaſe made at any other place will fade. To this add three ounces of cream of tartar; let them be both reduced to a very fine powder; but be ſure to take care to ſtop your noſe while the verdigreaſe is pounding, and hold a bunch of fine linen in your mouth, to breathe through; or, otherwiſe, the ſubtile powder of the verdigreaſe will offend you. When they are reduced to a fine powder, mix them both together, adding two quarts of water, and boil them in an earthen pipkin to the conſumption of one half; ſet it by till it is cold; ſtrain it, and put the liquor into a glaſs bottle; ſtop it up, and let it ſtand to ſettle till the liquor be very clear, and ſo you will have a delicate blue-green water for waſhing prints, &c.—But, the verdigreaſe not being always of a goodneſs, ſometimes the colour may not prove ſo deep as you would have it for ſome uſes. To remedy this, put ſome of it into a broad earthen diſh, and ſet it over a chafing-diſh of coals, and, by a gentle heat, cauſe ſo much of the liquid part to evaporate,

till by trying on a paper, and letting it dry, the colour is as you would have it.

Here you may note, that, if it ſhine too much when dry, it is not as it ought to be, for it is not rightly made, if it does any more than juſt ſhine; and, if you cannot make the colour by evaporating it, as before, without making it ſhine too much, the beſt way will be to add ſome more verdigreaſe, and boil it up again, till it becomes a tranſparent deep willow-green.

COPPERAS, } a mineral formed in copper mines, and which
COPERAS, } is properly a kind of vitriol.

Copperas is purified and prepared in the ſame manner as alum and ſalt-petre, by paſſing through ſeveral lixiviums, till it be wholly reduced to cryſtal.

There is Copperas of England, of Piſa, Germany, Cyprus, Hungary, and Italy; which only differ from each other in colour and perfection, being all the ſame mineral.

White Copperas is the Copperas of Germany, calcined, laid in water, then filtrated and reduced to ſalt; of which, as it coagulates, they form cakes of forty or fifty pounds each. Such are thoſe brought from Goſſelar in Germany.

The Saxon Copperas, before it is whitened, is of a bluiſh-green, clear and tranſparent.

The Engliſh Copperas is of a fine green; that of Cyprus and Hungary of a ſky-blue, in pieces cut like the point of a diamond; that of Piſa and Italy is likewiſe green, and the laſt is as tranſparent as glaſs.

Copperas is of conſiderable uſe in many preparations, but eſpecially in dying. The hatters alſo uſe it in their dye, and this and galls are the ingredients that compoſe writing-ink.

The ordinary Engliſh Copperas is made of a kind of ſtones found on the ſea-ſhore in Eſſex, Hampſhire, and ſo weſtward, ordinarily called gold-ſtones, from the colour; they abound with much iron.

To prepare the Copperas from them, they are laid in heaps or beds under ground. In proceſs of time they ſwell and ferment, and by degrees a humour diſtils out, which, drawn into a ciſtern, and being afterwards boiled, in the boiling ſhoots into thoſe cryſtals we ſee it in.

CORAL, is a production of the ſea, which is reckoned in the claſs of marine plants.

M. le Comte de Marſigli obſerves, it grows chiefly in grotto's, whoſe aperture or mouth opens to the ſouth, and the vault or concave arch is nearly parallel to the ſurface of the earth.

As to its growth, it is neceſſary that the ſea be as quiet and ſtill as a pond; it vegetates contrary to almoſt all other plants,

the foot of it adhering to the top of the grotto, and its branches extending downwards.

There are properly but three kinds of Coral, red, white, and black; the white is the rareſt, and moſt eſteemed; but the red is the moſt in uſe. It is procured by fiſhing.

It is to be choſen thick, ſmooth, and ſhining, and of a beautiful red, not covered with any tartarous matter.

CORAL *Fiſhery.* There are ſeveral places where this fiſhery is carried on, as the Perſian-gulf, the Red-ſea, the coaſts of Africa towards the Baſtion of France, the iſlands of Majorca and Corſica, and the coaſts of Provence and Catalonia.

The method of fiſhing is pretty much the ſame in all places, with that uſed at the Baſtion of France, where there is an eſtabliſhed fiſhery, under the direction of a company, and is as follows:

Each boat is manned with ſeven or eight men, commanded by the patron or proprietor; the caſter throws a machine, which performs the office of a caſting net, that tears up the coral from the bottom of the ſea; the other ſix manage the boat. This machine is compoſed of two beams tied a-croſs, with a leaden weight to preſs them down. To theſe beams is faſtened a great quantity of hemp, looſely twiſted round, among which they mix ſome ſtrong nets.

The machine, being thus furniſhed, is let down into the ſea, and, when the Coral is pretty ſtrongly intangled in the hemp and the nets, it is drawn up by a rope, which is unwound, according to the depth; and which ſometimes requires half a dozen boats crew to draw. If the cord happens to break, the fiſhermen are in great danger of being drowned.

Before the fiſhers go out, they agree on the price of the Coral, which is ordinarily at the rate of 4 s. 6 d. per pound.

The time of the Coral fiſhery is from April till July, which, when it is over, and in a ſeaſon, uſually amounts to twenty-five quintals of Coral to each boat; this is divided into thirteen parts; of which, the patron, or maſter coraller, has four; the caſter, two; and each of the ſix companions, one; the thirteenth being reſerved for the company.

To make artificial CORAL. Take the horns of a goat, ſcrape or ſhave them, reduce them to powder, ſteep them in a ſtrong ley made of the aſhes of the wood of an aſh, fifteen days together; then take it out of the ley, and mix it with cinnabar, diſſolved in water; hang it over an eaſy fire till it grow thick, and then, if it have the right colour of Coral, make it into what form or faſhion you pleaſe, and poliſh it according to art.

Another. Take cinnabar well beaten, and apply a layer thereof on a piece of wood well dried and poliſhed, being firſt moiſtened

moiſtened with ſize; then poliſh it again, and, for varniſh, rub over with the white of an egg.

CORRECTION, is repreſented, in painting, &c. by an old crabbed woman ſitting upon a bench with a whip in her left hand, and a pen in her right, with which ſhe is correcting a book. Old and croſs-grained, to ſhew that Correction is a prudent act in him that gives it, and grievous to him that receives it; and therefore ſhe has a rod in one hand, and a pen in the other; the book contains the cauſe of complaint and Correction.

Padre Giacomo CORTESI, called *Borgognone*, born in the year 1605, excelled in battles, died in the year 1675.

Pietro di COSIMO, born in the year 1441, ſcholar of Coſimo Roſelli, lived at Florence, excelled in painting bacchanals and maſquerades, died in the year 1521, aged eighty years.

COSMOGRAPHY, is repreſented, in painting, &c. by an ancient lady in a ſky-coloured ſtarry veſtment, under which is another of an earthy colour, ſtanding betwixt two globes, the celeſtial on the right ſide, and the terreſtrial on the left; holding an aſtrolabe in her right-hand, in her left the Roman radius. She is ancient, becauſe ſhe derives her pedigree from the creation of the world. Her garments denote her participating both of heaven and earth, as do the globes, as being the inſtruments, with which ſhe takes the diſtance and magnitude of ſeveral ſtars, and the operations upon earth.

COSTUME, in painting, as to obſerve the Coſtume, is to make every perſon and thing to ſuſtain the proper character; and not only to obſerve the ſtory, but the circumſtances, the ſcene of action, the country or place, but to make the habits, arms, manners, proportions, and the like to correſpond.



Peter COTTART, an engraver of vaſes, uſed this mark.



John COVAY, who engraved the works of Mr. Vouet, and others uſed this mark.

COUCH, in painting, is a term uſed for each lay or impreſſion of colour, either in oil or water; wherewith the painter covers his canvas, wall, wainſcot, or other matter to be painted. Thus they ſay, a painting has had its laſt Couch or lay; a cieling has had two Couches.

The word is alſo uſed for a lay or impreſſion on any thing, to make it more firm and conſiſtent, or to ſkreen it from the weather. Thus paintings are covered with a Couch of varniſh; a canvas, to be painted, muſt firſt have two Couches of ſize before the colours are laid. Two or three Couches of white lead are laid on wood before the Couch of gold is applied. The leather-

gilders

gilders lay a Couch of water and whites of eggs on the leather before they apply the leaf-gold or ſilver.

The gold wire-drawers alſo uſe the word Couch, for the gold or ſilver leaf, wherewith they cover the maſs to be gilded or ſilvered, before they draw it through the iron, that is to give it its proper thickneſs.

The gilders uſe the term Couch for the quantity of gold and ſilver leaves, applied on the metals in gilding or ſilvering. Each Couch of gold is but one leaf or two at moſt; and each of ſilver three, to gild. If the gilding be hatched, there are required from eight to twelve Couches; and only three or four, if it be without hatching. To ſilver there are required from four to ten Couches, according to the beauty of the work.

COUNTER-*Light*, } a window or light oppoſite to any
COUNTER-*Jour*, } thing, which makes it appear to a diſadvantage; a ſingle Counter-light is ſufficient to take away all the beauty of a fine painting.

COUNTER-*Drawing*, in painting, &c. is the copying a deſign or painting by means of a fine linen cloth, an oiled paper, or other tranſparent matter; whereon the ſtrokes, appearing through, are followed and traced with a pencil, with or without colour.—Sometimes Counter-drawing is done on glaſs, and with frames or nets divided into ſquares with ſilk, or with thread; and alſo by means of inſtruments invented for the purpoſe, as the parallelogram.

COUNTER-*Proof*, in rolling-preſs printing, a print taken off from another freſh printed; which, by being paſſed through the preſs, gives the figure of the former, but inverted.

To COUNTER-*prove*, is to paſs a deſign in black lead, or red chalk, through the preſs, after having moiſtened, with a ſponge, both that and the paper on which the Counter-proof is to be taken.

COWSLIPS, to paint them in miniature, it muſt be obſerved that they are of four or five colours, namely, of a very pale purple, of gridelin, of white and yellow.

The purple, for painting thoſe of that colour, muſt be made with ultramarine, carmine, and white; obſerving to diminiſh the quantity of the latter, when you are ſhading.

Thoſe of a gridelin colour muſt be painted with a light lake, a very little ultramarine, and a great deal of white; and ſhaded with the ſame, but darker.

The white ſort muſt be done with white alone, and ſhaded with black and white ſtrokes.

The eye of theſe three ſorts of Cowſlips, which is in the form of a ſtar, muſt be done with maſticote, and ſhaded with gamboge; and in the midſt of it a ſmall round of bladder green.

The

The yellow Cowſlip muſt be done with maſticote, ſhaded with gambooge and umber.

The buds, the leaves, and the ſtems muſt be verditer mixed with a little maſticote, and finiſhed with iris green; with this ſame colour the ribs and veins on the leaves muſt be expreſſed, heightening the lights of the largeſt with maſticote.

FML *Michael* COXIS, his mark on certain Arabian ſtories, in ſixty-eight plates, dated in different years; one is in 1576.

C. P. ſignifies Cornelius Pulemburgh pinxit, John Bronchorts inc.

LC *Luke Van* CRANOGIO, or *Luke Van* CRAEN, painter to the Duke of Savoy. His mark is ſometimes L. C. with a winged dragon, and the year 1509; at other times his mark is two little Gothic ſhields, or with the mark, or L. V. G. He engraved in wood and copper.

To make CRAYONS *or paſtils, of which there are different methods.* Some direct to take plaiſter of Paris or alabaſter calcined, and of the colour of which you intend to make your Crayons, a ſufficient quantity; to grind them firſt aſunder, and then together, and with a little water to make them into paſte; then to roll them with your hand, upon the grinding-ſtone, into long pieces like black-lead pencils, and then to dry them moderately in the air; which, when they are to be uſed, are to be ſcraped or ſhaved to a point like a common pencil.—Thus Crayons may be made of what colour you pleaſe, fitting them for the faces of men, women, landſcapes, clouds, ſun-beams, buildings, and ſhadows.

Another way. Take tobacco-pipe clay, and temper it with a little water with what colour you pleaſe, making ſeveral, according to the heights of colours you would make uſe of, which mix with the ſaid tobacco-pipe clay, ſo much as the clay will bear; work all well together, form them into Crayons, and ſet them to dry for uſe. Before they are quite dry, rub them over with a feather dipped in ſallet-oil, and let them dry thoroughly; by which means they will work free and eaſy.

Mr. Brown tells us, that he has taken yellow oker burnt, and rolled it up into a Crayon, and dried it with a moderate heat, and, when it was thoroughly dry, he made it very warm, and then dipped it into linſeed oil; and, being thoroughly ſoaked, he drew with it, and, rubbing it with his finger, it would not rub out, nor any part of it ſtir; and he believes all the reſt of the colours may be made to have the ſame quality; and adds, he doubts not but the German maſters and others of the low Dutch had that art, he having, by him, drawings in Crayons of Goltzius

zius and others, which were extremely neat, and would not rub out, being ſtrong, and like oil-painting.

The manner of laying the ground fleſh-colour for a face to be wrought upon with CRAYONS. The beſt way, ſays Mr. Brown, is to colour the paper that you intend to draw on with a carnation or fleſh-colour, near the complexion of the party you intend to draw after; and to cover the whole paper with the ſame complexion, which is made of ceruſs, meny, and yellow oker ground with a little gum arabic. When you prepare them, make a good parcel of various complexions together, it being not worth while to make one at a time.—This ground colour muſt be laid on with a wet ſponge, but let the colour be ſo bound with gum, that it will not ſtir from the paper by rubbing with your finger on it.

When this ground is dry, then ſketch or draw the firſt rough draught with coal; that being as you would have it, draw over the ſame line again more perfectly with red chalk; then, with your ſeveral Crayons, you are to rub in your colours firſt; then, with your fingers, you are to ſweeten and mix them together, ſcumbling them one into another, after the manner of the oil-painters. And, becauſe many times the Crayons will not ſharpen to ſo good a point as black or red chalk, you muſt be extremely careful to cloſe and finiſh all your work at laſt with red and black chalk, which you may ſharpen at your pleaſure.

There is another ordinary way of drawing in Crayons on blue paper; the ground colours are to be rubbed in firſt with a pencil, and afterwards with a ſtubbed pencil or your finger. And, if you pleaſe, you may work upon parchment exceeding neat and curious.

Of the making of CRAYONS *for dry colouring.* The uſe of Crayons for dry colouring is ſo neceſſary in taking off views and proſpects, and there are ſo few Crayons that are good of the ſort, that I think the way of making them a neceſſary article to be known to every one, who is a lover of drawing and painting.

White. As for white, we have no occaſion of any other than that of white ſoft chalk, which ſhould be ſawed into lengths of an inch and an half or two inches. When you have ſawed out your Crayons of chalk, which ſhould be at moſt a quarter of an inch thick, round off the corners with a penknife, and point them by drawing your penknife upwards from the place where the point is to be. You ought to have a dozen or two of theſe to lie in a little caſe by themſelves, or they will be diſcoloured by the others.

Yellow. Yellows come next, which ſhould be divided into four or five degrees of colour.

1ſt Yellow. Take ſome grounds of ſtarch and flower of brimſtone,

ſtone, mix them well with a knife upon a poliſhed marble, ſo that they produce the colour of ſtraw, or a yellow as will ſhew itſelf faintly; then pour a little milk to them, or a little pale ale-wort, till the colour become like a paſte; then ſpread the paſte on a ſmooth piece of chalk, with a broad knife, till it is about the third part of an inch thick, and let it lie till it is half dry; then, with a ſharp knife, cut it in lengths of an inch and an half, about the fourth part of an inch wide, and roll it thin between two little pieces of board, till they are round like a ſtraw, and point them as I have directed for the chalk. If you pleaſe, you may uſe ground chalk inſtead of grounds of ſtarch.

2d yellow. It is made of yellow oker, ground well with fair water, and then dried and beat. Mix this with ground chalk, in ſuch quantity as it will be a little deeper than the former colour, and mix them up with pale ale-wort, in which a little white ſugar-candy may be diſſolved; and make theſe Crayons as the former.

3d yellow. Grind yellow oker with water, with a ſtone and muller, and, when it is dry, beat it very fine, and make it into paſtils or Crayons, with pale ale-wort, or ſize made with glover's leather, boiled in water until it comes to a jelly; uſe it as before directed, and roll the paſtils between two boards.

4th yellow. Take Engliſh pink, grind it as the former with water, and, when it is dry, beat it fine, and mix it with a very little ground chalk, till it is deeper than the former colour; then put to it ſome wort of pale ale, ſtir all well together, and make it into paſtils or Crayons, by rolling in the foregoing manner.

5th yellow. Engliſh pink is to be ground as the former, and to be made in paſtils or Crayons, by itſelf, with pale ale-wort.

6th yellow. Dutch pink is to be uſed as the former, and mixed with pale ale-wort or milk, and to be rolled and dried.

7th yellow. Orpiment is one the moſt poiſonous colours that can be uſed; however, it is one of the moſt beautiful ſort, and is next to orange colour. This muſt have a little ground chalk mixed with it, well tempered together, and made up with pale ale-wort, with a little gum dragon diſſolved in it; and roll them up into paſtils, as you did the former.

Orange-colours. 1ſt orange-colour. Take yellow orpiment, mix it with pale ale-wort, and, when it is in paſte, roll it, and make it into paſtils or Crayons.

2d orange-colour. Take orpiment and red lead, let the red lead be very finely ground in water, and dried; then mix a little of this with your orpiment, till you have the colour you deſire; and putting in it ſome ale-wort, wherein ſome gum dragon has been

been diſſolved, make into a paſte, and roll it into paſtils or Crayons.

3d orange-colour. Take Engliſh pink, grind it well, and put to it as much vermilion as will make it of the colour you deſire; mix theſe up with ale-wort that has been boiled till is is more glutinous than ordinary, and make it into paſtils or Crayons, as before.

4th orange-colour. Take Engliſh pink finely ground, and put to it as much red lead well ground, as will make it agreeable to your deſign; mix theſe well with ale-wort boiled to a thickneſs, and make them into Crayons.

5th orange-colour. Take ſome Dutch pink well ground, and mix it with ſome red lead finely powdered, to the colour you want; then, with ale-wort or milk, make it into a paſte, and make it into paſtils as before.

Note, In the mixture of theſe colours, obſerve, that they have as many different ſhades as poſſible.

Reds. 1ſt red. Take red lead, grind it well with water; then dry it and beat it to a fine powder, and put to it ſome chalk or white lead finely ground to brighten it; mix this with ale-wort, wherein a little gum dragon has been boiled; make it into a paſte, and roll it into Crayons. Of this your paſtils ſhould be made, ſome deeper, others paler.

2d red. Take red lead, and grind it well with a marble and muller, make it into a paſte with ale-wort, in which gum dragon has been boiled.

3d red. Red oker wants no preparation, but ſawing, as directed for chalk, in the firſt article.

4th red. Take vermilion ground fine, and mix it with ſome fine chalk, or white lead, well pulveriſed; divide the compoſition into three parts, and, by adding more of the white to one than another, you may make three different colours; then put ale-wort boiled thick to each, and make them ſeverally into paſte, and then into paſtils.

5th red. Take vermilion, grind it well, and mix it with ale-wort, that has been boiled to a thickneſs with gum dragon, till it is a paſte; then roll it into Crayons or paſtils.

6th red. Take ſome good lake, well ground with water upon a marble, and, when it is well dried and powdered, divide it into three parcels, and mix with each as much chalk or white lead ground fine, as will make them of different colours; work them ſeverally into paſte; then roll them into paſtils or Crayons.

7th red. Take fine lake, and reduce it to as fine a powder as you can with water, and when it is dry, and again finely powdered, mix it with ale-wort, make it into a paſte, and roll it into Crayons.

8th red. Take Indian red well ground with water, and dry like the other colours; then mix it with ale-wort that has been boiled to a thickneſs with gum dragon. This alone will be a very ſtrong colour; but to make it of different ſhades you muſt mix it with white, each parcel ſo as to be ſhades to one another; then make them ſeverally into paſtils.

9th red. Take roſe-pink, and cut it into the ſhape of Crayons, without any preparation. Carmine is too dear for them; for twelve pennyworth would make but a ſmall Crayon.

Purples. 1ſt purple. Take roſe-pink finely ground and powdered; mix it well with a little ſanders blue, till the powder appears of the colour you deſire; then make it into a paſte with ale-wort, thickened with gum dragon, and roll it into Crayons.

2d purple. Take lake finely ground and waſhed, add to it as much blue bice as you think convenient to make it of a reddiſh purple, and you ſhould vary this in two or three manners, each lighter than the other; in the lighter ſorts, put a ſufficient quantity of chalk or white lead ground fine, and mix them up with ale-wort boiled to a thickneſs with gum dragon; then roll them into paſtils.

3d purple. Take ſome lake well ground, and to it add as much Pruſſian blue as will make it of the colour you intend; mix thoſe well together in different parcels, making ſome more inclining to red than the others; and, to make the fainteſt purple of them, add ſome chalk, ground at your diſcretion, and make them ſeverally into paſte, with ale-wort thickened by boiling; then into paſtils as before directed.

Blues. 1ſt blue. Blue bice is the lighteſt blue colour uſed, and muſt be well ground with fair water on a fine marble, and, when it is dry, reduce it again to a powder; then lay it in four parcels, and put to three of them, in different proportions, ſome chalk or white lead ground, ſo that, when mixed, each may be lighter than the other; mix theſe ſeparately with ale-wort, thickened with ſcraps of glover's leather; and, when they are made in a paſte to your mind, make them into paſtils, and the fourth part of the blue bice muſt be made up by itſelf in the ſame manner.

2d blue. Take verditer well ground on a fine marble, lay it in four parcels, and mix one of them purely with a thin ſize, made of white glover's ſhreds and ale-wort; and the other three parts mix with ſeveral proportions of chalk or white lead well ground, ſo as to make ſhades to one another; make theſe into paſte with ale-wort, thickened with gum-dragon, and then into Crayons.

3d blue. Take ſome Pruſſian blue well ground, and lay it in four parcels on your marble, and with three of them mix ſome chalk or white lead well ground to make them of different degrees of colour, and the fourth muſt be alone. Make the three mixed

colours

colours into paſte with pale ale-wort boiled till it thickens; and the plain colour muſt be made into a paſte with ſome ale-wort boiled, and thickened with white ſhavings of leather from the glovers. Make all theſe into paſtils.

4th blue. Take rock indigo well ground with water on a marble, dry it and powder it again; then divide it into parcels as before, and, with two or three parts of them, mix different proportions of ground chalk or white lead ground, to make them deeper or paler; and one part muſt be the ſimple colour. Put to the mixed colours ſome ale-wort thickened with boiling, and mix them to paſtes; then make them into paſtils.

As for the plain indigo, mix it with ale-wort thickened by boiling with glover's ſhreds of white leather, then make it into Crayons.

Blacks. 1ſt black. The black that is commonly uſed as a Crayon, is charcoal cut into lengths; the ſofteſt and beſt is that made of willow. Have at leaſt a dozen or two of theſe, for black and white are a great deal more uſed than any other colour.

2d black. Take ivory black ground very fine with common water; add to it a very little ground indigo; for a bluiſh caſt will enliven the black, and help that deadneſs, which a plain black always carries with it.

Browns. 1ſt brown. Take, for a light brown, ſome fuller's-earth, grind it well with water, and mix with it ſome ground chalk or white lead, to make it in different colours, that is lighter or darker, as you think proper; mix this up with pale ale-wort boiled thick, and have at leaſt four ſorts of it.

2d brown. Take ſome Spaniſh brown ground very well, and mix with it ſome fuller's-earth, to make it lighter, for the Spaniſh brown is a dark colour of itſelf; and, when you have made this mixture, you may put to ſome part of it a little chalk or white lead ground in different proportions, to have them of different ſhades: Theſe are for the lighter browns; and mix them ſeverally in paſtes with a light ſize of fiſh glue, or iſin-glaſs and water, and ſome of them with pale ale-wort boiled thin, or thick water-gruel boiled with gum-dragon; then make them into Crayons.

3d brown. Take Spaniſh brown ground fine, and ſome Indian red; mix them well together, and to them put ſome pale ale-wort, till they become a paſte. You may make ſome of them lighter with chalk, or white lead ground; then roll them into paſtils.

Greens. 1ſt green. Take ſome verdigreaſe, boil it in ſharp vinegar, and, when it boils, add a little tartar powdered, which will ſo diſſolve the verdigreaſe, that the liquor will be of a fine colour; then ſet the liquor in little gallipots expoſed to the air, which will

will dry the colour, and then it will diſſolve in common water. This may be taken with as much warm ale-wort as will cover it, and will diſſolve the green; then make it into paſtils, with ground white chalk, as much as you think fit.

2d Green. Take diſtilled verdigreaſe ground with vinegar on a marble, waſh it well with water; the manner of which is, to throw the verdigreaſe into water, and in half a minute to pour off the water into a cup, and let it ſettle; then pour the water from it, and waſh it again in the ſame way; and, when this is dry, make it into paſtils with ale-wort.

3d Green. Take verdigreaſe prepared as before, finely powdered; and mix it with a little Pruſſian blue in ſeveral proportions. In the lighteſt ſorts, put a little white, or the brighteſt yellow well ground, to make varieties of colour; mix all theſe with pale ale-wort boiled to a thickneſs.

4th Green. Take indigo well ground, and ſome Engliſh pink; mix theſe well together upon a marble, and, when they are well powdered, make them into a paſte, and roll them up with a ſoft ſize and oil into the ſhape of Crayons, or with pale ale-wort or thick water-gruel; but, when you uſe water-gruel, it muſt be ſtrained and boiled with ſome gum-dragon.

5th Green. Take blue bice ground fine, add to it ſome Dutch pink well ground; mix them in parcels, and prepare them in ſhades to one another, then make them into paſtes, and roll them into paſtils. You may have five or ſix ſorts of theſe.

Note, The liquid you uſe to make them into paſtils, muſt be ale-wort boiled a little thick.

6th Green. Take rock indigo ground very fine with water on a marble, and, when it is dry, beat it fine again; then divide it into parcels on the marble; and to ſome of them put a little flower of brimſtone in greater or leſſer quantities; to others flower of brimſtone and Dutch pink mixed, ſo that you may have variety of colours. When you have thus made the different ſhades you intend, then make them into paſtes with ale-wort thickened by boiling with white glover's ſhreds of leather, or a little gum-dragon; and roll them into Crayons.

7th Green. Grind rock indigo with water, and put to it, in ſeveral parcels, as much Dutch pink as you think fit, to make your greens of various ſhades; when theſe are well mixed, put to them ſome ale-wort thickened by boiling, with which make them into paſtes; then roll them into paſtils.

Note, The reaſon why theſe paſtils are better than thoſe in common which are bought at ſhops, is becauſe they are generally made too ſtiff with gums, and ſo will hardly touch the paper; and all theſe will work freely, and expreſs the ſeveral colours you deſire.

The reaſon why you are to make five or ſix ſhades of each colour is, becauſe we cannot mix any when we uſe them; whereas in oil-painting, and painting in water-colours, we can make what mixtures we pleaſe in an inſtant: And when we are about any painting or drawing in Crayons, which happens to have a great variety of colours in it, we ought to have every ſort of colour that can be thought on.

Note, Theſe colours ſhould be kept in a box partitioned, every ſort by itſelf.

With all theſe you will be compleatly furniſhed; and, when you go out to take any view, have one of every ſort in a little box, to carry in your pocket.

The paper which you ſhould uſe on this occaſion, ſhould be Venice rough paper, almoſt like our whited brown paper, or even the whited brown paper ſold at every chandler's ſhop; the ſtiffer it is, the better; that which they call cap-paper is the beſt, as you will find by experience, for upon ſuch the colours eaſily diſtribute themſelves. And by this means you may take figures in their proper colours as you ſee them, for you may match the colours as they appear with the Crayons you have by you; and, as the Crayons are dry, they will not alter their colour, whereas the wetted colours will appear deeper when they are wet, than when they are dry, which will deceive the eye of a young beginner.

Remember, when you uſe theſe Crayons, that you point them from the bottom upwards, and make not the points too ſharp, except in the white chalk, the red oker, and the charcoal.

You may make a pretty drawing on blue paper, with only chalk and charcoal; the ſtrong lights and the dark ſhades make a fine contraſt, and a pleaſant appearance in a drawing.

CREDIT, is repreſented, in painting, &c. by one at man's eſtate, nobly cloathed, having a gold chain about his neck, with a merchant's book of accounts indorſed on the cover, Solutus omni fœnore, free from all intereſt, and a griffin below.—His age ſhews that he may have credit, as does his ſenator's gown; the gold chain ſeems to command credit; the motto ſignifies true credit; the griffin was in great credit amongſt the ancients, and uſed for a ſymbol of ſafe cuſtody, and therefore intimates, that a perſon ſhould have a watchful eye over his ſtock, if he means to get credit.

CRIMSON, a very beautiful colour much uſed in painting. Carmine is the moſt beautiful Crimſon known; but it is neceſſary that the buyer be informed, that there are ſeveral ſorts of it ſome darker and ſome much coarſer than others, and therefore it ſhould never be bought by candle-light, unleſs of ſuch in whom one can confide; for between the beſt and the worſt there is ten ſhillings

an ounce difference; nay, indeed all the money an ounce will coſt, becauſe that which is bad will ſpoil the work.

A tranſparent CRIMSON. A liquid colour, not much inferior to carmine itſelf, may be made of the raſpings of braſil wood, ſold at the dry-ſalters, and at ſome colour-ſhops.

To make this tranſparent Crimſon colour, boil an ounce of the raſpings of braſil wood in twelve ounces of pale ſtale bear and a little alum, till the colour of the liquor is as ſtrong as you pleaſe; which you may diſcover by dipping into it a ſlip of white paper; and, when this colour is as you would have it, and it is cold, paſs it through a linen cloth, and put the clear liquor into a bottle for uſe. If you would bring this colour to a body, take ox blood and dry it, till it can be reduced to a powder, which, being mixed with it, will give a colour, which will not be much inferior to a middling ſort of carmine.

A CRIMSON *colour from Mr.* Boyle. Take the fruit of the berry-bearing ſpinach, which every gardener about London knows; preſs them, and you will have a beautiful red-coloured juice from them; boil this and put about a fourth part of alum to it, when you pour it into the veſſel where it is to cool, and it will make as fine a colour as any others that are noted, and for a ſmall expence, for it will grow any where; and, in one bunch of the fruit, there are ſeeds enough to ſow two or three roods of ground.

The red beet-root, baked with a little ſtrong vinegar, produces an elegant red colour, equal to a tincture of carmine; then pour it on alum, and it is fit for uſe, where carmine ſhould be uſed in waſhing of prints; for it is a fine tranſparent red.

A CRIMSON *colour for waſhing prints*, &c. Put thirty or forty grains of cochineal bruiſed into a gallypot, and as many drops of tartar-ley as will juſt wet it, and make it give forth its colour; and immediately add to it half a ſpoonful of water, or more if the colour be yet too deep, and you will have a delicate purple liquor or tincture. Then take a bit of alum, and with a knife ſcrape very finely a very little of it into the tincture, and this will take away the purple colour, and make it a delicate Crimſon. Strain this through a fine cloth into a clean gallypot, and uſe it as ſoon as you can; for this is a colour that always looks moſt noble, when ſoon made uſe of, but will decay, if it ſtand long.

To dye a common or ſlight CRIMSON. For one pound of woollen take two ounces of alum; two ounces of white tartar; one ounce of aqua-fortis, tempered with half an ounce of Engliſh tin; a pound of madder, and a quarter of a pound of blue wood. Boil the ſtuffs well in this liquor, then let them cool and rinſe them out.

To finiſh the dye. Put into the liquor a quarter of a pound

of blue wood, three ounces of pot-aſhes, and ſtir the ſtuffs very briſkly in it. This dye looks very well, and may ſerve for ſlight ſtuffs, and ſuch as are deſigned for linings, and that are kept from ſweat, wet, and weather; but it quickly fades.

To dye a very fine CRIMSON. For ſixteen pounds of woollen ſtuffs, boil twelve gallons of water, or rather more; to which put in ſixteen handfuls of wheaten bran; let it ſtand a night to ſettle, ſtirring it very well, and in the morning pour off the clear liquor, or rather ſtrain it, that it may be perfectly clear.

Mix one half of this liquor with as much clean water, that the ſtuffs or wool may be worked commodiouſly in it.

Boil this mixed liquor, and put into it one pound of alum, and half a pound of tartar; boil theſe very well, and then put in the goods, and boil them for two hours, keeping them ſtirring (eſpecially if they are made of wool) from top to bottom continually.

To finiſh it. Boil the remainder of the bran and water with an equal quantity or rather more fair water, and, when it boils apace, put in four ounces of cochineal, and two ounces of pure white tartar powdered; ſtirring it about, and taking care that it neither runs over, or boils too faſt; and, when it is very well boiled, put in your ware, and ſtir it about till you find that it has taken the dye equally every-where; then cool and rinſe it out.

To dye a natural or lively CRIMSON. Firſt wet the goods well, and, for every pound of ſtuff to make the ſuds, uſe two ounces and an half of tempered aqua-fortis; three ounces and an half of tartar; an ounce and an half of cochineal; and eight ounces of alum; boil the ware with all theſe for half an hour, let them cool, and rinſe them out.

To finiſh the dye. Boil four ounces of cochineal, three ounces of ſtarch, three ounces of white tartar, and half an ounce of white arſenic together for a quarter of an hour; then put in the goods, and let them boil for above half an hour, or till they have taken the dye well and equally.

To dye ſilk a CRIMSON. The ſilk having been prepared as before directed, allow an ounce and an half of cochineal to every pound of ſilk, pound it to powder, and paſs it through a hair ſieve; then put it into the remaining pail of liquor laſt mentioned, and hang it over the fire again; then with the liquor put it into a braſs kettle, and cover it very cloſe that no duſt may get in; hang it over the fire again, and add to it an ounce and an half of white arſenic, and two ounces and an half of tartar, both reduced to a fine powder; boil them together for a quarter of an hour; then take it off the fire, and let it ſtand a very little while, and then put in the ſilk, ſtirring it about very well, that the colour may not be variegated, when the liquor is cold; then wring out the ſilk, and, if it is not tinged enough, hang the dye over the fire

again, and, after the ſilk has been beaten, put it in again as before.

When the ſilk is dyed, you muſt in the firſt place rinſe it out in hot ſuds, made by putting half a pound of Venice ſoap, in proportion to every pound of ſilk; let it be diſſolved in it, and afterwards put the ſilk into cold river water; then beat it upon a block and hang it to dry; then ſpread it abroad, wound and managed according to cuſtom, and it will be a very beautiful Crimſon.

If you would dye Crimſon from a violet ground, you may always abate one third part of the quantity of the ingredients; that is, a pound of ſilk ſo grounded will not require above an ounce of cochineal, as much of arſenic, and two ounces of tartar.

To dye ſilk a dove CRIMSON. The ſilk having been alumed, as above directed, clean rinſed, and hung upon poles, take a kettle; ſcour it very clean, fill it with water, and to each pound of ſilk put a ounce of cochineal; ſtir the ſilk in the liquor, and boil them for an hour; then rinſe the ſilk out, wring it, and dry it.

You muſt take ſpecial care that the ſilk is not party-coloured or of different colours, by taking the colours better in one place than in another; and, for that reaſon, it muſt be put in when the liquor is no more than lukewarm.

To dye a CRIMSON *with orſeille.* Fill a clean kettle with fair water, and allow three quarters of a pound of orſeille to every pound of ſilk; ſtir the ſilk about in it and wring it out; then add a quarter of a pound of alum, and a handful of white arſenic to every pound of ſilk.

Let the ſilk lie in this liquor a whole night, the next morning wring it out carefully and dry it, afterwards take two ounces of cochineal, two ounces of galls, and two ounces of gum, and a little turmeric to every pound of ſilk; put in the ſilk and boil it for two hours; then put in a little zepſie, let the ſilk lie in it all night, and next morning rinſe it and dry it according to art.

To dye ſilk an orange CRIMSON. Put clean rain water into a very clean kettle, then put four ounces of pot-aſhes, and four ounces of orleans; ſtrain them through a ſieve into the kettle, and diſſolve them very well; then the boiled and alumed ſilk, being firſt well rinſed from the alum, muſt be ſtirred about in it and boiled, then wrung out and rinſed and beaten; then to every pound of ſilk take twelve ounces of galls, which boil two hours, and then let them cool for two hours, and afterwards lay the ſilk to ſoak in it for three or four hours; after which take it out, wring, rinſe, beat, and dry it.

To dye ſilk an iſabella CRIMSON. Prepare the ſilk, rinſe and beat it very well, then ſtir it about in the ſame liquor in which the orange colour is dyed, and ſo you will have a fine iſabella Crimſon.—Then rinſe, wring, and beat it well, and lay it in the

gall ſuds, which the orange has before been in for three or four hours; and afterwards rinſe and dry it very well.

If you have no orange ſuds, take for every pound of ſilk one ounce of orleans, half an ounce of pot-aſhes, and dye it therein like the orange, then gall it, rinſe and dry it.

The CROCUS *Flower*, is of two colours, the yellow and the blue or purple.

To paint the yellow Crocus, take maſticote and gall-ſtone, ſhaded with gamboge and gall-ſtone, expreſſing three lines or rays on the outſide of the leaf, ſeparate from, and parallel to each other, with biſtre and pure lake, which muſt be ſcumbled into the ſtrokes of the ground or leaf; and the inſides of the leaves muſt be all yellow.

For the purple Crocus, lay on carmine, mixed with a little ultramarine and white, expreſſing deep purple ſtripes on ſome of the leaves, as you did for the yellow, and on others only fine veins.

The ſeed of both ſorts is yellow, and muſt be done with orpiment and gall-ſtone; for the ſtalk, lay on white, and ſhade with black, mixed with a little green.

The green of this flower is a pale verditer, ſhaded with bladder green.

CROCUS *martis*, a chemical preparation uſed by the glaſs-makers to give a red colour to glaſs.

The glaſs-makers prepare this themſelves, and have five ways of doing it. The firſt is this: Take filings of iron, mix them with three parts of powdered brimſtone, and keep them in a melting pot, in a furnace, to calcine, and burn off the ſulphur; let them ſtand four hours in this ſtate, then take them out, and, when cold, powder and ſift them, and put the powder into a crucible, which lute over, and ſet it in the leer of the furnace for fifteen days or more; it will then be of a reddiſh purple, and muſt be kept for uſe.

The ſecond way of making this, is by ſprinkling filings of iron with ſtrong vinegar, and ſetting them in the ſun to dry; when dry, powder and ſift them, and wet them again with vinegar; and, when dry, powder them again; repeat this eight times, and then powder the whole, and ſift it fine for uſe.

The third way, is to uſe aqua-fortis inſtead of vinegar, in the ſame manner.

The fourth way, which is the beſt of all, is this: To diſſolve filings of iron in aqua regia, and let the ſolution ſtand three days in a veſſel cloſe ſtopped, ſhaking it about at times; then evaporate the liquor gently, and there will remain a moſt valuable Crocus martis.

The method of making CROCUS *veneris*. Take as much æs uſtum as

as you pleaſe, add to it its weight of green verdigreaſe, and as much ſal armoniac fixed and fuſile; pound the whole well together, and dry them over the fire in a large iron ſhovel; then into the ſhovel pour ley of urine, and make the whole boil till the ley be intirely conſumed; then put on more of the ſame ley, boil it again till the ley be conſumed as before, and repeat this a third time.

Then pound or grind this mixture, and put it into a reverberatory that it may calcine well; then pound it again till it is reduced to an impalpable powder, and put it into an earthen glazed pot; pour upon the ſame ley of urine, wherein you diſſolve it, viz. to each pound of ley put four ounces of ſal armoniac fixed and fuſile.

Then boil the whole over a gentle fire in aſhes for the ſpace of a quarter of an hour; then decant off that ley into ſome proper veſſel, for that will contain the tincture of the æs uſtum, and of the green, which it has extracted.

Then put more ley upon the matter, and boil it a quarter of an hour more over the ſame fire; then decant off that ley to the former: Continue thus to water it with freſh ley, and decant it off to the former, as long as it will extract any ley from the matter.

Then take all theſe tinctured leys, and filtre them through whited brown paper; then evaporate three quarters over a gentle fire.

Put the remainder into a alembic, with the helm or head on, and the receiver, and diſtil till it be dry; then will you find, at the bottom of the alembic, a Crocus veneris of a very wonderful virtue for colouring glaſs, &c.

Another eaſy way of making CROCUS *veneris.* Take of copper ſimply calcined one part, of ſulphur vivum eight parts; powder them well, and mix them together in a large crucible; ſet it into a coal fire in a little furnace, ſtirring the matter continually with an iron rod, till the ſulphur be conſumed; repeat this operation five or ſix times, then caſt it thus refined into an iron pan of boiling water; ſtir it often with a ſtick, while the calx deſcends to the bottom; then, the water being ſettled and clear, evaporate the whole. and you will find at the bottom of the veſſel a Crocus veneris very fine and red.

Mr. CROSS, was a famous copier in the reigns of king Charles I. and Charles II. A ſtory goes of him, that, being employed by king Charles I. to copy ſeveral pieces in Italy, and having leave of the ſtate of Venice to copy the famous Madona of Raphael, in St. Mark's Church, he performed the taſk ſo admirably well, that he is ſaid to have put a trick upon the Italians, by leaving his picture there inſtead of the original; which laſt he brought away with that celerity and caution, that, tho'

ſeveral meſſengers were ſent after him, he had got ſo much the ſtart of them, that he carried the piece dexterouſly off.

CRUCIBLE. Theſe veſſels, ſo much uſed by aſſayers, &c. are beſt made of pure and well waſhed clay, with an admixture of the pureſt ſand-powder of flint, or the powder of other broken Crucibles, which have already ſuſtained a great fire, and are very clear; they are formed in wooden or braſs moulds, divided longitudinally into two parts, and to be disjoyned, or put together again, at pleaſure. For this purpoſe alſo a broad iron ring is adapted to the outſide of the mould in ſuch a manner, that the two ſides are kept firmly together while this ring is on, and fall aſunder as ſoon as it is taken; this mould however gives only the outer ſhape of the Crucible, its cavity muſt be made by a peſtle or other ſuch inſtrument.

When theſe veſſels are to be made, the ring is put upon the mould, and the whole ſet upon a ſtrong ſupport; then the cavity of the mould is to be filled with the matter very ſtiff; this is to be preſſed down firſt with the fingers or with a ſtick, making a hollow in the middle, and leaving the edges of the matter above the ſides of the mould; then apply to this hollow the peſtle, rubbed over with the fat of bacon, and drive it in with ſeveral ſtrong ſtrokes of a mallet; then take away the peſtle, and take the ring off from the mould; the Crucible is taken out perfect and finiſhed, and is to be dried and baked in a potter's kiln.

If from the too great moiſture of the matter, when put into the mould, or from any inequalities or roughneſs in the mould, the Crucible will not readily ſeparate from its ſides as ſoon as made, ſet the mould in a warm dry place for a few minutes, and the veſſel will after that come out eaſily.

In making theſe veſſels, a ſufficient quantity of matter muſt always be put at once into the mould; for, if you add to the matter, once compreſſed, a new lump of the ſame, it will not cohere with the firſt. If the matter be put into the mould in ſmall maſſes, not moulded thoroughly together firſt by handling, theſe never cohere together, but the veſſel, when finiſhed, will be full of chinks and pores, which, though not to be diſcovered either by the eye or by the ſound of the veſſel when ſtruck, yet let the ſalts in fuſion paſs through them.

If theſe veſſels are not made with a large bottom, the concave mould muſt not be greaſed; for, if it be, the veſſel comes out of it with the peſtle, and ſticks ſo firmly to it, as not to be got off without breaking.



Theodore CRUGER or *Greuger*, an engraver, uſed this mark.

CRYSTAL, is a kind of mineral, or rather a tranſparent ſtone,

ſtone, white like a diamond, but much inferior to it in luſtre and hardneſs; it is uſed for many purpoſes.

The ancients were but little acquainted with the nature of Cryſtal.

Pliny treats of it as water hardened and petrified, which ſeems to have been the popular opinion of thoſe times; but experience has taught the contrary, for by a chymical analyſis, inſtead of reſolving into water, it yields nothing but a calx, earth and ſalts.

As for the places where Cryſtal is found, they are both rocks and rivers. Pliny tells us, that he has ſeen it dug from off the higheſt and rougheſt rocks of the Alps, and thence probably it has taken the name of rock Cryſtal.

And, whereas it is ſometimes found in rivers and brooks, yet is is not formed there; but waſhed down thither from off the mountains by violent rains.

Several mountains of Europe, and ſome of Aſia, produce rock Cryſtal, and the French relation of Madagaſcar (if we can give credit to it) informs us, that that iſland yields more than all the world beſides.

The perfection of Cryſtal conſiſts in its luſtre and tranſparency; that Cryſtal which has incloſed in it ſtraws, duſt, clouds, &c. is little valued.

It is frequently found hexagonal, the edges inimitably fine and accurate.

It is cut or engraven in the ſame manner, and with the ſame inſtruments, and by the ſame workmen as diamonds.

CRYSTAL is alſo a name given to a factitious body caſt in the glaſs-houſes alſo called Cryſtal glaſs.

This is in effect a glaſs; but carried in the melting, and in the matter of which it is compoſed, to a degree of perfection far beyond the common glaſs, though it comes far ſhort of the whiteneſs and vivacity of Cryſtal.

CRYSTAL, *the way of calcining natural or rock Cryſtal, to make an extraordinary frit.*

Although we may imitate natural Cryſtal by help of art, and make as fine with the materials we have ſhewn elſewhere how to prepare; yet the way we are going now to deſcribe of making a frit of natural Cryſtal, will make one ſo extraordinary, that it will ſurpaſs in beauty all we have ſhewn the preparations of.

Make natural Cryſtal red-hot in a crucible covered cloſe; then extinguiſh it in water, and reiterate the ſame eight times; then dry it well, and grind it on a ſtone to an impalpable powder.

Often purify this powder of Cryſtal, after the ſame way as is ſhewn for the purifying POLVERINE of rochetta, which ſee, obſerving all that is ſaid on that ſubject.

Then mix that cryſtalline matter with about one third part of

ſalt

ſalt extracted from polverine of rochetta prepared, make a frit of it, then put it in a pot well heated in the furnace, and, when it is in good fuſion, add to it a proportionable doſe of prepared manganeſe.

After that, often pour it into the water to purify, as is noted in ordinary Cryſtal, and puriſy it very well at the fire before you work it, and you will have a Cryſtal more ſhining and beautiful than you have otherwiſe ever ſeen.

The way of preparing natural CRYSTAL. This is done by calcination, which to perform well, obſerve the following directions:

Take the faireſt natural Cryſtal you can get, that being the baſis for artificial gems; it is no matter whether it be in great or ſmall pieces.

With theſe pieces of Cryſtal, fill a large crucible, cover it with a cover made of the ſame earth, that is ſomewhat broader than the mouth of the crucible, for fear aſhes or coals ſhould tumble in.

Set this crucible in burning coals in a little furnace, and, when the Cryſtal is well heated, caſt it into a veſſel of cold water; the more water there is, ſo much better will the calcination be performed, becauſe the cold of it is ſo much the greater.

Then take it out of the water, and dry it in an earthen ladle; then put it into the ſame crucible to be heated again, taking care to cover it well; then caſt it again into freſh cold water, and repeat heating it and quenching it thus twelve times, changing the water each time.

You may know if your Cryſtal be well calcined, for it will eaſily break and crumble; if there appear in it any black veins, you muſt take care to take them all clean out by breaking them, and do this till only the white remains behind; then it is well prepared.

After you have well dried your Cryſtals thus calcined, grind them to an impalpable powder on a marble or porphyry ſtone, by putting a little on at a time, and ſearce it well through a fine ſilken ſieve.

This powder of Cryſtal being what is uſed for all artificial gems, it will be proper to keep a good quantity ready by you, which you may always have recourſe to in working.

If you would ſucceed very well in this art, you muſt not uſe ordinary frit of Cryſtal, how good and fair ſoever it be, nor chalcedony, nor tarſo, nor any other ſtones; for the glaſs made of them is far leſs fair and reſplendent than that made of natural Cryſtal, which has the moſt luſtre, and approaches the neareſt to precious ſtones.

To make pearl colour in CRYSTAL. True pearl colour is ſo fine

fine and ſhining, that it might ſeem difficult to give it to Cryſtal; yet it is ſo eaſy, that tartar alone does it.

Thoſe who have a mind to perform this proceſs, muſt calcine their tartar, till it becomes white.

The having well purified the frit of the natural Cryſtal, and it being in a good fuſion in the furnace, this white tartar muſt be caſt into it at ſeveral times, mixing the whole well each time, which muſt be continued to be done till the glaſs becomes of a pearl colour; for there is no other rule in this caſe than experience to guide yourſelf by.

When the colour is come to perfection, it muſt be wrought preſently, becauſe the colour will ſoon be loſt; but works may be made of it of extraordinary beauty.

The way to make a very fine and perfect CRYSTAL. This cryſtal will be white, very bright, clean and beautiful, if care be taken in the managing of it in the working.

Take Cryſtal frit prepared, and put it into a little pot in the great furnace, putting into it by little and little, and at ſome interval of time, as much manganeſe of Piedmont as is ſufficient, after it has been prepared.

The frit being thoroughly melted, you muſt take out the pot, and put it in a great earthen veſſel full of cold water, or in clean wooden veſſels.

This way of putting the frit into water ſerves to take from it the ſandever, which is noxious to the Cryſtal, and makes it obſcure and cloudy, and very diſagreeable to the ſight.

Then put it again into a clean pot, and, being melted, caſt it again into water, which muſt be repeated until the Cryſtal be ſeparated from all this ſort of ſalt.

In the laſt place, let it ſtand five or ſix days in the pot in the oven to boil, and ſtir it as little as poſſible with the iron; for it is apt to diſcolour it, and ſo make it blackiſh.

Being well boiled and clear, ſee if it hath manganeſe enough, which may be known by inſpecting it, viz. if it be white; but, if it be ſtill greeniſh, you muſt add more manganeſe to it, and then let it boil till it is clear, and of a ſhining colour.

The property of manganeſe added to it in due quantity is to perfect the Cryſtal, and to take from it a foul and dull green, and give it a bright and ſhining whiteneſs; you muſt take heed to add by little and little, and by degrees; otherwiſe it will rather ſpoil than perfect the Cryſtal, blacken it, and taking away its luſter.

All this depends on the ſkill and diſcretion of the workman, for there is no certainty or ſtanding rule for the quantity to be added.

As ſoon as your Cryſtal is fine and ſhining, you may uſe it with-

without delay, for what veſſels or other works you deſign to put it to; but, in the mean while, you muſt have leſs fire than for common glaſs, and it muſt be very clear and without ſmoak, for reaſons elſewhere given.

The workman muſt alſo take care, that his iron rods be clean and well poliſhed, and that the necks or collets of the glaſſes, where the irons touch them, be always kept out of the pots of Cryſtal, becauſe the iron always diſcolours the Cryſtal; wherefore particular care is to be taken as to that matter.

None of our modern workmen (or at leaſt very few of them) take the pains of this way of ſeparating the ſandever from their materials, by caſting them into water; they content themſelves with ſkimming it off with an iron ladle, when it ſwims on the top; though, if it does not all ſeparate, the Cryſtal and glaſs will be leſs clear and fine.

Obſervations for a gold colour in CRYSTAL. Gold, being the pureſt and moſt perfect metal in nature, muſt needs require materials very pure to imitate it.

This obliges us here to note, that, to make a Cryſtal of a fine gold colour, the frit muſt be made of fine ſalt of polverine, prepared and purified as is taught elſewhere, which is the only means of obtaining it.

For, if there ſhould be mixed any of the frit, made of the ſalt extracted after the common way, by the help of tartar, the colour would be very imperfect, wanting the true ſplendor and beauty.

To make a ſky colour and ſea-green in CRYSTAL. This fine colour requires a Cryſtal frit, well purified from its ſalt, and that has not been put into water.

Put ſixty pounds into a pot, and, having well prepared it, put in one pound and a half of ſcales of copper in powder, the preparation of which is ſhewn, with four ounces of zaffer prepared and mixed together, and ſtir the whole well with the glaſs for the ſpace of two hours.

Then examine if the colour be to your mind, and let it ſtand at reſt for twenty-four hours; then ſtir the whole again as before, that it be well mixed with the glaſs, and the colour incorporated with it; then it may be wrought.

The colour may be heightened as you pleaſe, but take care you do not make it too high.

If you mix with frit of rochetta as much Cryſtal frit, you will have as fine a blue as can be wiſhed.

A ſky colour or ſea-green in CRYSTAL. You muſt uſe for this colour, which is a little cloſe, the ſame Cryſtal frit made with rochetta or polverine of the Levant; and, having filled a pot with it, let it be well purified, taking off the ſalt that ſwims at top;

op; then put to it twenty pounds of metal, ſix ounces of the powder of calcined copper, by little and little ſtirring it well, obſerving the ſame rules given for the ſea-green before. Then you will have a very admirable colour, which you may make lighter or deeper as you pleaſe.

Two hours after, ſtir it again well, and you may then examine if the colour pleaſes you, in which caſe, let it ſtand ſtill twenty-four hours without any ſtirring, and then it may be wrought as before.

The way to tinge natural CRYSTAL *of a viper colour.* The green viper colour is very dangerous to make, by reaſon of the materials, of which it is compoſed, if great care be not taken.

Take two ounces of rock Cryſtal of a good water, two ounces of crude antimony, and as much orpiment, with one ounce of ſal armoniac; reduce theſe three laſt into powder, lay the pieces of Cryſtal, layer upon layer, in a good crucible, cover it with another that is bored through the bottom; lute them well together, and, when the lute is dry, ſet them into a furnace in the middle of the coals; let them be gently lighted, that the furnace may grow hot by degrees.

It will ſmoak very much when it firſt grows hot, wherefore the operation muſt be performed in a large chimney, that the ſmoak may fly away; nor muſt you ſtay in the laboratory, becauſe is is very dangerous, and may prove mortal.

Let the fire kindle of itſelf, and go out, and the crucible grow cold; then take out the pieces of Cryſtal that lie on the top of the crucible, which will have the colour of rubies, and be marked with fine ſpots; and thoſe that are at the bottom will for the moſt part have the colour of vipers.

Separate the other pieces from them, which will be of other colours, and poliſh the whole at the wheel like other ſtones; then with foils you may ſet them in gold.

Theſe ſtones will be of a very agreeable colour.

To make, in natural CRYSTAL, *the colour of rubies, topaz, opal, gyraſol, and others.* It does indeed ſeem ſomething ſtrange that Cryſtal, mixed with matters that tinge them, ſhould in the ſame veſſel receive ſo many different colours.

But if it be conſidered, that the ſpirits of theſe matters have virtues different from thoſe of their bodies, you will not ſo much wonder at theſe diverſities.

The pieces which lie higheſt, are the moſt penetrated by theſe tinging ſpirits, which always aſcend, and ſo give them more vivacity and colour; and ſo to the others in proportion to their orders.

For this operation. Take two ounces of orpiment of a yellow colour approaching gold or ſaffron, and as much white arſenic,

arſenic, one ounce of crude antimony, and an ounce of ſal armoniac; reduce them all to powder, and mix them together; with this powder, ſtratify pieces of natural Cryſtal, in a large crucible, putting the leaſt pieces to the bottom, and the biggeſt at the top, which ought to be fine and without ſpots.

The crucible being filled with the powder and Cryſtal, cover it with another bored at bottom, lute them well, and let the lute dry. This crucible is bored to let the fumes of the materials aſcend through the hole, and by that means tinge the Cryſtals in paſſing, which they would not do ſo well, if they paſſed out at the ſides.

When the lute is dry, ſet the pot in the furnace, and cover it with coals up to the middle of the crucible towards the top; then put ſome live coals to them, that they may kindle by themſelves by degrees; the coals ought to be large ones, and made of oak.

Go out of the laboratory preſently to avoid the fumes, which are dangerous, as was ſaid before; but prepare the fire ſo well that it may kindle of itſelf, and burn well that the buſineſs may ſucceed; and let the fire go out of itſelf, taking care that no air can get in at the mouths of the crucibles, for that would make the Cryſtals break, and then they would be good for nothing.

When the crucibles are grown cold, unlute them, and take out the Cryſtals, the greateſt part of which will be tinged with the colours beforementioned; let the beſt of them be poliſhed at the wheel, which will alſo brighten their colours, and make them look like oriental ſtones, and they will be fair and hard as they are.

All the ſucceſs of this ſecret conſiſts in the orpiment, which muſt be of the colour of gold; and, if you ſhould not ſucceed the firſt time, you muſt try a ſecond.

An admirable blue CRYSTAL. To procure this fine colour, take one ounce of powder of Cryſtal, one drachm and fifty-ſix grains of fine ſalt of tartar, the whole reduced to a fine powder; put it into a crucible covered and luted, which bake and purify twenty-four hours in a glaſs-houſe furnace, then ſet it to cool gently twelve hours in the annealing furnace, and you will have very admirable blue, which you may cut and poliſh, &c.

The way to make a ſalt of ſeveral vegetables, which will produce a CRYSTAL *of a wonderful fineneſs.* It has been obſerved, that the ſalt which ſerves to make glaſs, is extracted from polverine of the Levant, from rochetta and ſoda; and the way of extracting it is there ſhewn; here I ſhall acquaint you, that any vegetable, that abounds with alcalious ſalt, is proper to make glaſs and Cryſtal, by preparing its aſhes as there ſhewn.

Several plants are good for this purpoſe, but thoſe that grow near

near the ſea-ſide are always the beſt, becauſe they acquire a great deal of ſalt by their nearneſs to the ſea.

Alga is one of them. See ALGA.

Pot-aſhes are alſo proper on this account; they are brought from Poland, Ruſſia, and New England; and are aſhes, for the moſt part, of firs and pines, and their apples.

The ſalt of all ſorts of aſhes may ſerve for common (or green) glaſs, notwithſtanding that of the aſhes of the common thiſtle is the beſt; but all ſorts of thiſtles are good.

Next to thiſtles, hops are the beſt, taking both ſtem and branch when the flowers are gathered.

Among trees the mulberry is the beſt (C. M. ſays, the bramble-buſh) as alſo geniſta ſpinoſa, and the haw-thorn, and black-thorn, which bears blackberries, and, among the ſea-plants, kali ſpinoſum.

So that it ſeems, that thoſe plants which are thorny and prickly afford in their kind the beſt and moſt ſalt.

All ruſhes and reeds which grow in marſhes and in pools, and in ditches of water, and on banks of rivers, yield a great deal of ſalt fit for theſe purpoſes.

Next to the beforementioned are all bitter herbs, as hops, wormwood, carduus benedictus, centaury, gentian, ſouthern-wood, tanſy wood, which they uſe in dying wool; the heads of poppies, and ſeveral other plants; tobacco ſtalks, all leguminous plants, have the ſame virtues; bean cods and ſtalks yield an admirable ſalt for making Cryſtal; peaſe, vetches, millet, lupine, and lentils, as alſo cabbage heads, and ſeveral other ſorts of plants.

Add to theſe milky plants all ſorts of tithymals or ſpurges, cataputium, the fig-tree, vine-branches, and ſow-thiſtles.

Of all the fixed ſalts which are extracted from plants, obſerve, that thoſe are the beſt that are freeſt from earth, and all ſorts of heterogeneous bodies, and which are united in the hardeſt and whiteſt lumps, and are moſt ſharp to the taſte.

That the beſt aſhes and fulleſt of pure ſalt run ſooneſt in the furnace.

That thoſe are the beſt aſhes of vegetables that are made while they are green, and of the biggeſt branches.

That thoſe ſalts muſt be diligently kept in a dry place, remote from any moiſture, that may be hurtful to them; that the aſhes of oak, which partake of a vitriolic nature, make a glaſs of a darker colour; and aſh and haw-thorn, their ſalts being more nitrous, make the whiter metal.

C. SCHOENIUS, ſignifies Martin Schoenius, a Calembach painter and engraver, in the time of Albert Durer. He

died

died in the year 1486; ſome of the curious ſuppoſe him to be the ſame with Buonmartino.

DE CUERENHERT, his mark in ſeveral Turkiſh ſtories, and various ſubjects, invented by Martin Heemſkerk.

CURIOSITY, is repreſented, in painting, &c. by a woman having abundance of ears and frogs on her robe; her hair ſtanding up an end, wings on her ſhoulders, her arms lifted up, ſhe thruſting out her head in a prying poſture. — The ears denote the itch of knowing more than concerns her; the frogs are emblems of inquiſitiveneſs, by reaſon of their goggle eyes; the other things denote her running up and down to hear and ſee, as ſome do after news.

CUSTOM, is repreſented, in painting, &c. by an ancient man in a walking poſture, with a grey beard, leaning on a ſtaff with a label inſcribed, Vires acquirit eundo, with a burden of muſical inſtruments, and a grindſtone behind him.—His age ſhews, that, the more he advances in time, the firmer does he ſtand, intimated by the motto, to which agrees the grindſtone alſo, for, if it be not turned, it has not the force to wear the knife by grinding; the laws of Cuſtom are valid and always prevail.

CUTTING *in wood*, is a particular kind of ſculpture or engraving, denominated from the matter wherein it is employed.

It is uſed for various purpoſes, as prints and ſtamps for printing paper, linens, calicoes, &c.

The invention of cutting in wood, as well as that of copper, is aſcribed to a goldſmith of Florence; but they both owe their perfection to Albert Dùrer and Lucas.

The art of Cutting in wood was certainly carried to a very great pitch, a hundred and fifty years ago, and might even vie for beauty and juſtneſs with that of engraving in copper.

At preſent it is but in a low condition, as having been long neglected, and the application of artiſts wholly employed on copper, as the more eaſy and promiſing province; not but that their wooden cuts have the advantage of thoſe on copper on ſeveral accounts; chiefly for figures and devices in books, as being printed at the ſame time, and in the ſame preſs as the letters; whereas the other requires a particular impreſſion in the rolling-preſs.

One Hugo de Carpi invented a manner of cutting in wood, by means of which the prints appeared as if painted in clear-obſcure; in order to this he made three kinds of ſtamps for the ſame deſign, which were drawn after one another through the preſs for the ſame print. They were ſo conducted, that one ſerved for the grand lights, a ſecond for the demi-teints, and a third for the outlines and the deep ſhadows.

The

The cutters in wood firſt prepare a block of the ſize and thickneſs required, and very even and ſmooth on the ſide to be cut; the wood of theſe blocks is uſually pear-tree or box, though the latter is the beſt, as being the cloſeſt and leaſt liable to be worm-eaten.

On this block they draw their deſign, with a pen or pencil, juſt as they would have it printed. Thoſe who cannot draw their deſign, make uſe of the deſign furniſhed them by another, faſtening the paper upon the block with a ſort of paſte made of flower and water with a little vinegar, the ſtrokes or lines turned towards the wood. When the paper is dry, they waſh it gently over with a ſponge dipped in water; which done, they take off the paper by little and little, ſtill rubbing it a little firſt with the tip of the finger; till at length there be nothing left on the block, but the ſtrokes of ink that form the deſign, which mark out ſo much of the block, as is to be ſpared or left ſtanding.

The reſt they cut off, and take away very curiouſly with the points of very ſharp knives, or little chiſſels or gravers, according to the bigneſs or delicacy of the work.

CUTTING, in painting, is the laying one ſtrong lively colour over another without any ſhade or ſoftening. The Cutting of colours has always a diſagreeable effect.

D.

D. Stands for Domenichino of Bologna, a famous painter and inventer.

DANGER, is repreſented, in painting, &c. by a ſtripling walking the fields, treading upon a ſnake, which bites his leg; on his right ſide is a precipice, and a torrent on the other; he leans only upon a weak reed, and is ſurrounded with lightning from heaven.—His youth ſhews the Danger he is in; his walking ſhews that men, walking through flowery fields of proſperity, fall into ſome calamity unawares; the reed ſhews the frailty of our life in continual Danger; the lightning, that we are ſubject beſides to Danger from heaven.

Henry and *John* DANKERS. Henry was a good landſcape-painter, and employed by king Charles II. to paint all the ſea-ports of England and Wales, and alſo all the royal palaces, which he performed admirably well; he was firſt bred a graver, but, upon the perſuaſions of his brother John, took to painting; he ſtudied ſome time in Italy before he came to England; he worked for a great number of our gentry, and had good prices for what he did, being eſteemed the neateſt and beſt painter in

his way of that time. He left England in the time of the popiſh plot, being a Roman Catholic, and died ſoon after at Amſterdam.

John Dankers was a good hiſtory-painter, and lived not many years after his brother; dying alſo at Amſterdam.

PD *Peter* DARET, who engraved various portraits, uſed this mark.

The DARK *Way of painting.* As to the colours, they are prepared in the ſame manner as the other colours are for the light way of painting, (for which ſee the article LIGHT *Way of painting*) except that there muſt not be any egg uſed in them.—You muſt firſt mark the paper with black lead, if white; and with tobacco-pipe clay, if Dark. This you may do at pleaſure, becauſe you cannot ſpoil it; only take care that you mark out the figures as loſty with the landſcapes as you can; then take a little blue verditer and flake-white for the ſky, in which you need not be difficult, becauſe you muſt go over it again.

Then daſh out at pleaſure, and where you pleaſe, the blue, with a little lake, or roſe-pink and flake-white.

Then ſtrike the bottom of the ſky, but not on the blue, with a little red lead, flake-white, and yellow; all which may be done as quick and rough as you pleaſe.

After you have done this, lay the diſtant hills with a little blue verditer and flake-white, but inclining moſt to the verditer; then, for the neareſt hills, lay them with the ſame colours, and a little roſe-pink added to them.

With this colour alſo you muſt lay diſtant houſes or towers; and then ſtrike the colour the neareſt your pattern with flake-white, blue verditer, and Dutch pink; then lay it here and there under the white and yellow; add a little Spaniſh brown to this or whatever green you uſe, dipping your pencil into any other colour, and mixing it with the aforeſaid green for variety.

Here and there you may intermix a purpliſh colour, and ſo work in all manner of colours, according as you ſhall pleaſe.

Obſerve to make the loweſt colours the darkeſt part of the landſcape, and lay in the houſes and trees, as you come down with the grounds. All this you may do at pleaſure, for the finiſhing will ſet all to rights; nor will it be any matter, if in the colouring your ground is gone over with your colours here and there.

Then draw your figures more perfectly with verditer, carmine, and litmoſe. This likewiſe you may do without fear; becauſe, when you come to lay the colours of the figures, all will be rectified.

After you have drawn the figures, look and fill up every place that is left with colour; and afterwards go over the ſky with

with a large pencil, with a little blue ſmalt and ſlake-white, mixed well, to a fair ſky, leaving the light part of the ſky clear at the bottom; then ſhadow the remote hills, here and there, with thin blue ſmalt; and, where they are deepeſt, with the thick part of the colour; then touch the purpliſh hills with blue ſmalt alone, and ſometimes carmine and litmoſe, or gamboge and litmoſe.

Make the diſtances in as many different colours as you can, ſhading your diſtant blue-greens with litmoſe and gamboge, to which a little indigo may be added. Shade the diſtant yellow-greens with gamboge and verdigreaſe; and reddiſh-greens, with gamboge, verdigreaſe, and red oker.

Let ſome of the diſtant grounds incline to blue, ſome to greeniſh, ſome to yellowiſh, and ſome to reddiſh.

When you have ſhaded the diſtant, ſhade the nearer things, ſuch as trees, cattle, rocks, ruins, &c. For blue trees, take indigo and verdigreaſe; if yellow, gamboge and verdigreaſe; and, in the darkeſt, add a little indigo; if reddiſh, red oker and verdigreaſe, and ſhade ruins with gamboge and litmoſe; if reddiſh, add carmine; if bluiſh, add litmoſe; obſerving that the darkeſt ſhade for cattle, ruins, grounds, or the ſtumps of trees, is generally carmine, verdigreaſe, and litmoſe; only, in the darkeſt of all, add a little indigo.

This will do for cattle, birds, buildings, Dark grounds, Dark garments, the darkeſt ſhade of the face, and ſtalks of trees.

When the diſtant things have been ſhaded, ſtrike the Dark ſhades under the figures, which will be a direction to you in the grounds; and ſo ſhade the reſt of the grounds with a yellow, bluiſh, and purpliſh ſhade, taking care not to mix any earth colours with them; unleſs it be black with gamboge or indigo with carmine and verdigreaſe, and this muſt be done but ſeldom.

If the litmoſe and verdigreaſe be both thick, you will ſeldom want earthy colours; and ſo finiſh the ſhades in the landſcapes.

For ſeas, uſe litmoſe, gamboge, and indigo, mixing it to a purpliſh ſea-green; for Dark waters, indigo, the darkeſt carmine and verdigreaſe, inclining moſt to indigo; if light waters, thin indigo.

Herbs are to be done after the ſame manner as trees.

Then lighten the landſcape thus: For clouds, uſe French oker and ſlake-white, laying it thin at firſt, and then work it thicker with red lead and ſlake-white, or carmine and ſlake-white, which you muſt do to all the lightening colours.

After you have done the landſcape thus far, you may lay in the figures in the following manner:

Draw the figures with carmine, verdigreaſe, and litmoſe

without fear; for, if you are out, the colouring will rectify all.

Then lay in the proper colours, and cover the ſtrokes you have drawn; becauſe theſe, not being perfect, are only for a direction for you in laying the colours bold and free.

In colouring the garments; for blue ones, uſe blue and white; for a roſe colour, carmine and white; for green, blue verditer, Dutch pink, and white; for a purple, blue verditer, roſe-pink, and white; for yellow, roſe-pink, Dutch pink, and white; and ſo add white to an earthy colour, according to your fancy.

In colouring faces, for a fair one, uſe red lead, carmine, and white; for red, more red lead, and ſome yellow; for Dark ones, add a little litmoſe; for brown, add ſome umber or yellow oker to the red lead and white.

For fair hair, take umber and white, or yellow oker and white; for Dark, burnt umber, or Spaniſh brown and white.

Firſt lay the garments, then the faces, then the hair, and then the girdles.

Having thus laid the figures, draw out the figure as perfect as you can with verdigreaſe, litmoſe, and carmine; becauſe this will be a guide to you in all the ſhadows.

When you have done this, ſhadow them thus: For a roſe colour, uſe thin carmine; in the darkeſt ſhades, uſe roſe-pink and carmine, or lake; for a deep blue, gloſs over the blue with ſmalt; and, when it is dry, ſhade with litmoſe, and in the darkeſt parts with Cologn earth and carmine; for yellow, gamboge and umber; for a ſtraw colour, gamboge and black; for purple, carmine and litmoſe; for a cloth colour, carmine, verdigreaſe, and litmoſe.

For cattle, buildings, or ruins, uſe verdigreaſe, litmoſe, and carmine; if the ſhadows are to be blue, take more litmoſe; if yellow, gamboge; if red, carmine and verdigreaſe.

For umbering the faces, uſe carmine and verdigreaſe, adding litmoſe for a fair one.

With this ſhading, you may ſhade all faces, taking care, if the face is to be fair, to add more litmoſe; if red, more carmine; if yellow, more verdigreaſe.

After that the faces have been ſhaded with theſe ſhades, then, for a fair face, take French yellow oker and flake-white, and heighten the lighteſt parts of the face; then add a little carmine, and lighten the darkeſt ſide; and afterwards ſmooth the edges of the light parts, that the colours may lie as if put on at once.

Having done this, go over the Dark ſhades with carmine, verdigreaſe, and litmoſe, to make them look clear, giving the darkeſt ſome touches with the ſaid colours.

As to the farther finiſhing of the face, it is the ſame as that mentioned in the light way of painting; but uſe no egg at all.

DARK *Tent*, a portable camera-obſcura, made not unlike a deſk, and filled with optic glaſſes, to take proſpects of landſcapes, buildings, fortifications, &c. See CAMERA-OBSCURA.

DAVID, king of Iſrael, is repreſented with brown hair, a ruddy complexion, and with a long beard.

Natural DAY, is repreſented, in painting, &c. by a winged boy, with a circle in his hand, in a chariot above the clouds, with a lighted torch. The chariot drawn by four horſes, one white, one black, and the other two bay, ſignifying the four parts that make up a natural day, i. e. the riſing and ſetting, noon and midnight; all the time the ſun ſpends in going once round the whole orb, which the circle ſhews.

D. B. ſignifies Bernard Gallo, called the Short. He engraved ſeveral works, and among the reſt Ovidii Metamorphoſes, and the Old and New Teſtament, printed at Lyons in 1559.

A DEAD-*colouring*, in miniature, to repreſent death.

In the firſt place, lay on white orpiment and oker very pale, and then proceed with vermilion and lake, inſtead of carmine and a great deal of white, and work thereon with a green mixture, in which is more blue than of any other colour, that the fleſh may appear livid.

The teints muſt be the ſame as for another colouring; but there muſt be more of them blue than yellow, particularly for the retreating parts, and about the eyes; and the yellow teint is to be uſed for the parts which advance fartheſt out.

Theſe teints muſt be made to dye away in each other, after the accuſtomed manner, ſometimes with a very pale blue, and ſometimes with oker and white, and a little vermilion, ſoftening the whole together; the parts and the outlines muſt be rounded off with the ſame colour.

The mouth muſt be almoſt a purple; but, nevertheleſs, you are to begin upon it with a little vermilion, oker, and white, and finiſh with lake and blue; and, for the ſtronger ſtrokes, you muſt uſe biſtre and lake, which are uſed alſo for the eyes, the noſe, and the ears.

If it be a crucifix, &c. where there muſt be an appearance of blood; after the fleſh is finiſhed, you muſt colour with vermilion, and finiſh with carmine, ſwelling out the drops of blood, and giving them a roundneſs.

As for the crown of thorns, lay on ſea green and maſticote, ſhade with biſtre and green, and refreſh the lights with maſticote.

DEATH, is repreſented by a ſkeleton, covered with a rich mantle, embroidered with gold, and his face covered with a fine maſk.—The ſkeleton, &c. declares, that, whilſt he ſtrips gran-

dees of all that they have, he cures the afflicted of all their trouble; the fine maſk, that he is gentle to ſome, terrible to others, indifferent to the courageous, and odious to cowards.

DEBT, is repreſented, in painting, by a melancholy young man, with a green bonnet on his head; a plate of iron upon both his legs, and about his neck; holding a baſket in his mouth, and a ſcourge in his hand.—Melancholy, becauſe in debt; poor cloaths, his finding no more credit; the green bonnet alludes to the cuſtom of ſome countries, where ſuch who are bankrupts, are forced to wear them; the ſcourge, becauſe debtors in Rome were whipped.

DECEIT, is repreſented, in painting, by a man cloathed with the ſkin of a goat; from the middle downwards are two ſerpents tails, in one hand fiſh-hooks, in the other a net full of fiſh; a panther by him, with his head between his legs, which ſhews that fiſh are catched by deceiving them; and the panther, by hiding his head, and ſhewing his fine ſkin, is ſaid to intice other beaſts; and the two ſerpents tails ſhew deceit.

DECEMBER, is drawn with a horrid aſpect, clad in an Iriſh rug, or coarſe frize girt about him; upon his head, three or four night-caps, and over them a Turkiſh turbant; his noſe red, and his beard hung with icicles; at his back, a bundle of holly and ivy; having on his hands furred mittens, holding a goat.

DECENCY, is repreſented, in painting, &c. by a youth of a gentle aſpect, with a lion's ſkin on his back; in his right-hand he holds a cube, in the middle of which is the cypher of Mercury; a branch of amaranthus in his left-hand, with this motto, Sic floret decoro decus; his garment is embroidered with the ſame, and he wears it for a garland; on his right-foot a buſkin, on his left a ſock.—Handſome, becauſe decorum is the ornament of human life; genteel, becauſe always accompanied with Decency; the lion's ſkin denotes the ſtrength of mind aſſigned to the obſervers of due decorum; the amaranthus denotes continuance, for that never withers; the cothurnus and ſoccus, or buſkin, denote Decency in the geſture and behaviour; the firſt belonged to noblemen, the other to the inferior ſort.

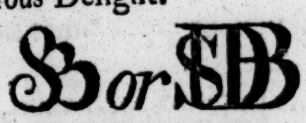
DEFENCE, is repreſented, in painting, &c. by a young lady in armour, holding a naked ſword in her right-hand; in her left, a target, and an hedge-hog in the middle.—Her youth denotes her fitneſs to defend herſelf; the armour and ſword, both offenſive and defenſive actions; the hedge-hog denotes Defence, which, upon any danger, will roll itſelf in its prickly ſkin, bidding defiance.

DEFENCE *againſt enemies*, is repreſented, in painting, &c. by a lady, whoſe head-dreſs is ſet with precious ſtones; in her hands a ſquill, or ſea onion; a ferret at her feet, with rue in its

its mouth.—The precious ſtones denote charms againſt evil; the ſquill, they ſay, rubbed upon a gate, lets no evil come in; the ferret provides rue for its own Defence, againſt the baſiliſks, &c.

DEJECTION. See SORROW.

DELIGHT, is repreſented, in painting, &c. by a boy of ſixteen, with a pleaſant aſpect, in a green ſuit, adorned with various colours; a garland of roſes, a violin and its bow, a ſword, a book of Ariſtotle, one of muſic; two pigeons billing.—His countenance denotes Delight; the green ſignifies the vivacity and delightfulneſs of green meadows to the ſight; the violin, Delight in hearing; the book, Delight in philoſophy; the doves, amorous Delight.



Stephen DELLA *Bella*, of Florence, a famous and whimſical engraver, uſed theſe marks; his other mark is S. B.

DEMOCRACY, is repreſented, in painting, &c. by a lady meanly dreſſed, with a garland of vine twiſted, with a branch of elm ſtanding upright; holding a pomegranate in one hand, and ſerpents in the other; ſome corn ſcattered upon the ground, and ſome in ſacks.—The garland denotes the union; the mean habit, the condition of the common people, that cannot equal thoſe that are higher, and therefore ſhe ſtands up; the pomegranate denotes a people aſſembled into one body, whoſe union is regulated according to their quality; the ſerpent, union; but creeps, not daring to aſpire; the grain, the public proviſion, cauſing union.

DEPART, is a method of refining or purifying gold by means of aqua-fortis.

There are three different ways of refining gold: The firſt is by antimony, the ſecond by ſublimate, and the third, which is moſt uſual, by aqua-fortis.

As to the operation of the Depart, they take at the rate of one pound of pure gold, and two of ſilver; theſe they fuſe together in a crucible, and, when fuſed, caſt them into cold water, where they become divided into grains of the bigneſs of peas.

Theſe grains, being taken out and dried by the fire, are put into a departing veſſel, which is a ſtone matraſs, and to the metal is added four pounds of aqua-fortis.

Then they take the veſſel and ſet it on coals, and, in about the ſpace of an hour, the refining is finiſhed; for upon opening the veſſel they find nothing therein but the aqua-fortis, and the gold reduced into a calx or ſand; the ſilver being all diſſolved and imbibed by the water.

To raiſe the gold to its due fineneſs, they uſually give it the aqua-fortis again and again; uſing, for the firſt time, half a pound,

and, for the ſecond, a quarter of a pound of the water to eight ounces of metal.

If the third water be found good and clear, the operation is finiſhed; and the calx of the gold, waſhed in repeated water, is melted down again in a crucible, firſt by a gentle, and after by a vehement fire, to be caſt into ingots or wedges.

It is to be obſerved, that the ſilver, together with the impurities of the gold, are ſo thoroughly incorporated with the water, that there does not appear to the eye any thing but the pure liquid; yet is not this ſilver loſt.

In order to recover it again out of the menſtruum, they divide the ſtock of aqua-fortis into ſeveral ſtone veſſels, which are filled up with ſpring water; obſerving to put ſeven or eight times as much of this as of that.

This being done, a quantity of copper is put into each veſſel, and the whole is left for twenty-four hours, at the end of which time the ſpirits of the aqua-fortis are found to have quitted the ſilver, and to have incorporated with the copper, leaving the ſilver in the form of a calx or aſhes at the bottom.

This calx, being dried, is melted into an ingot with a little ſalt-petre.

To be good huſbands of the aqua-fortis, and make it ſerve again for a ſecond operation, they diſtil it in an earthen or glaſs alembic, and, when the diſtillation is about a third over, they change the recipient.

If the aqua-fortis, having quitted the ſilver, and being united with the copper, be then filtrated, it is called aqua ſecunda. In which, if you ſteep an iron plate ſome hours, you will have another Depart. For the menſtruum will let go the copper and prey on the iron, leaving the copper in powder on the iron plate.

And, by filtrating this diſſolution, you may alſo get the iron out of it by laying in it a piece of lapis calaminaris; for the iron, in that caſe, will Depart to the bottom, and the lapis will be diſſolved.

And if you again filtrate this water, and pour on it the liquor of fixed nitre, you will have another Depart; the lapis precipitating to the bottom.

And, laſtly, filtrating this water as before, and evaporating it, you will have cryſtals of ſalt-petre.

William DERYKE, was a hiſtory-painter, born at Antwerp; he was firſt bred a jeweller, but afterwards took to painting. He for many years drew hiſtory as big as the life, in England, with tolerable ſucceſs in his works; there were many excellent parts of a boldneſs of pencil, whatever there might be wanting in grace and a pleaſing variety; he died about fifty-three years ago, leaving

leaving behind him a daughter, whom he had inſtructed in this art.

DESIGN, or draught, is uſed to ſignify the thought, plan, geometrical repreſentation, diſtribution, and conſtruction of a painting, building, &c.

In building it may be called ichnography, when, by Deſign, is only meant the plan of a building, or a flat figure drawn on paper.

Or orthography, when ſome face or ſide of the building is raiſed from the ground,

And ſcenography, when both front and ſides are ſeen in perſpective.

DESIGN, is alſo particularly uſed, in painting, for the firſt idea of a large work, drawn roughly, and in little, with an intention to be executed and finiſhed in large.

In this ſimple ſenſe, the Deſign is the ſimple contour or outline of the figures or things intended to be repreſented, or the lines that terminate and circumſcribe them.

Such a Deſign is ſometimes drawn in crayons or ink, without any ſhadows at all; ſometimes it is hatched, that is, the ſhadows are expreſſed by ſenſible lines, uſually drawn acroſs each other, with the pen, crayon, or graver.

Sometimes, again, the ſhadows are done with the crayon rubbed, ſo that no lines do appear at all; and, ſometimes, the grain or ſtrokes of the crayon appear as not being rubbed.

Sometimes the Deſign is waſhed, that is, the ſhadows are done with a pencil in Indian ink, or ſome other liquor; and ſometimes the Deſign is coloured, that is, colours are laid on, much like thoſe intended for the grand work.

The qualities or parts, required in a Deſign, are correctneſs, good taſte, elegance, character, diverſity, expreſſion, perſpective.

Correctneſs, depends principally upon the juſtneſs of the proportions, and a knowledge of anatomy.

Taſte, is an idea or manner of deſigning, which ariſes either from the complexion or natural diſpoſition, or from education, the maſters, ſtudies, &c.

Elegance, gives the figures a kind of delicacy, which ſtrikes people of judgment, and a certain agreeableneſs, which pleaſes every body.

The character is what is peculiar to each thing, in which there muſt be a diverſity, inaſmuch as every thing has its particular character to diſtinguiſh it.

The expreſſion, is the repreſentation of an object, according to its character, and the ſeveral circumſtances it is ſuppoſed to be in.

The perſpective, is the repreſentation of the parts of a painting

or figure, according to the ſituation they are in, with reſpect to the point of ſight.

The Deſign or draught is a part of the greateſt import and extent in painting. It is acquired chiefly by habit and application, rules being of leſs avail here than in any of the other branches of the art, as colouring, clair-obſcure, expreſſion, &c.

The principal rules of deſigning are,

1. That young beginners accuſtom themſelves to copy after good originals at firſt ſight, not to uſe ſquares in drawing for fear of ſtinting and confining their judgment.

2. To ſtay till they can Deſign well after the life, before they begin the practice of perſpective rules.

3. In deſigning after the life, to learn to adjuſt the bigneſs of their figures to the viſual angle, and the diſtance of the eye from the model or object.

4. To mark out all the parts of their Deſign, before they begin to ſhadow.

5. To make their contours in great pieces, without taking notice of the little muſcles and other breaks.

6. To make themſelves maſters of the rules of perſpective.

7. To obſerve every ſtroke as to its perpendicular parallel and diſtance, and particularly ſo to compare and oppoſe the parts, which meet upon and traverſe the perpendicular, ſo as to form a kind of ſquare in the mind; which is the great, and almoſt the only rule of deſigning juſtly.

8. To have a regard not only to the model, but alſo to the part already deſigned, there not being any ſuch thing as deſigning with ſtrict juſtneſs, but by comparing and proportioning every part to the firſt.

The reſt have a relation to perſpective, as,

1. That thoſe objects whoſe rays meet in a point are ſeen at one view.

2. That the eye and object be always conceived as immoveable.

3. That the ſpace or medium between be conceived to be tranſparent.

4. That the eye, object, and picture be at a juſt diſtance, which is uſually double the bigneſs of the ſubject or picture.

DESIGNING, is the art of delineating or drawing the appearance of natural objects by lines on a plane.

To deſign, according to the rules of mathematics, makes the ſubject of perſpective. See PERSPECTIVE.

To deſign by the camera-obſcura, See CAMERA-OBSCURA.

DESIGNING, is repreſented, in painting, &c. by a ſtripling of a noble aſpect, with a garment of rich cloth, holding compaſſes

paſſes in one hand, and a mirror in the other.—His aſpect ſhews, that all things are made by art more or leſs handſome, according to the more or leſs Deſigning; the compaſſes, that Deſigning conſiſts in meaſuring; the glaſs denotes, that a good imagination is requiſite.

DESIRE, is an agitation of the ſoul, cauſed by the ſpirits which diſpoſe it to the Deſire of thoſe things which ſeem agreeable to it; ſo we deſire not only the preſence of an abſent good, but the preſervation of the preſent. Deſire has this peculiar to it, that it agitates the heart more violently than any other of the paſſions, and furniſhes more ſpirits to the brain; which paſs from thence into the muſcles, and render all the ſenſes more acute, and all the parts of the body more active.

If love be joined to Deſire, that may be repreſented in drawing, painting, and ſtatuary, by the eye-brows preſſed, or cloſe together, and advanced or forwards towards the eyes, which will be more open than ordinary, with the eye-ball in the middle inflamed or full of fire; the noſtrils riſe up and are contracted or drawn cloſeſt towards the eyes, the mouth half open, the corners drawn back, and the tongue may appear upon the edge of the lips, the colour more inflamed than in love, all theſe motions ſhewing the agitation of the ſoul cauſed by the ſpirits, which, being in motion and diſpoſing it to Deſire a good repreſented as convenient for it, give a lively glowing colour.

Deſire may alſo be expreſſed by the arms being extended towards the object deſired, and the whole body inclining the ſame way; and all the parts appearing in an unquiet and wavering motion.

DESPAIR, is an opinion of the impoſſibility to obtain what we deſire, and makes us loſe even what we poſſeſs.

Extreme DESPAIR, may be expreſſed, in drawing, painting, and ſtatuary, by a man grinding his teeth, foaming and biting his lips, his forehead furrowed with wrinkles from the top to the bottom, the eye-brows drawn downwards over the eyes, and preſſing one another on the ſides of the noſe; the eyes ſeeming fiery and full of blood, the eye-ball diſturbed or wandering, and hid under the eye-brow, the lower part of the eye will ſeem ſparkling and unſteady, the eye-lids ſwelled and livid; the noſtrils large, open, and riſing upwards, the end of the noſe ſinking down; the muſcles, tendons, and veins of theſe parts being very much ſwelled and ſtretched, as alſo all the veins and nerves of the forehead, temples, and the fore-parts of the viſage; the upper part of the cheeks will appear large, but ſcored and drawn in about the jaws; the mouth, being drawn backwards, is more open at the ſides or corners than the middle; the under lip is large

and

and turned out, the lips are pale, as is the reſt of the face, and the hair ſtaring and ſtanding upright.

In Deſpair all the parts of the body are almoſt in the ſame ſtate as in anger, but they ſhould appear more diſordered; for you may expreſs one in this condition, tearing off his hair, biting and tearing his fleſh, or running and precipitating himſelf.

DESPISING *Pleaſure*, is repreſented, in painting, &c. by a man armed with a garland of laurel, going to fight, a ſerpent and a ſtork by his ſide; at his feet many ſerpents, which the ſtork fights with beak and claws.— Armed, becauſe the Deſpiſing thoſe things requires magnanimity, the ſtork fighting againſt the pleaſures of the world; and earthly thoughts are intimated by the ſerpent, always creeping on the earth.

DESPISING *the world*, is repreſented, in painting, &c. by a man armed, a palm branch in one hand, and a ſpear in the other; turning his head aſide towards heaven, he tramples upon a crown, which ſignifies his undervaluing riches and honours. His head denotes, that ſuch diſeſteem proceeds from ſanctified thoughts of God; his being armed intimates, that he attained not ſuch perfection without fighting.

DESTINIES, are the three ſiſters which the Latins call Parcæ, named Clotho, Lacheſis, and Atropos.—Clotho is feigned to have the charge of the births and nativities of mortals; Lacheſis of all the reſt of their life; and Atropos of their death, or departure out of the world.

They are all three repreſented, in painting, &c. ſitting on a row, very buſily employed in their ſeveral offices, the youngeſt ſiſter drawing out of a diſtaff a thread of a reaſonable bigneſs, the ſecond winding it about a wheel, and turning the ſame, till it becomes little and ſlender; the eldeſt, which is aged and decrepid, ſtands ready with a knife or ſhears to cut it off, when ſpun. They are painted in white veils, and little coronets on their heads wreathed about with garlands of flowers of narciſſus.

DESTINY, was alſo repreſented as a lady in a great rage or fury, and of exceeding celerity, holding in her hand an iron bow, ready bent, aiming to ſtrike Fortune, even at the very heart.

DETRACTION, is repreſented, in painting, &c. by a woman ſitting, lolling out her tongue, a black cloth over her head; her garment torn and ruſty-coloured, ſpread here and there with tongues; a cord about her neck inſtead of a bracelet; in her right-hand ſhe holds a dagger as if ſhe would ſtab.— Her ſitting denotes idleneſs, the main cauſe of Detraction; her mouth open, proneneſs to Detraction and back-biting; the ruſty-coloured garment, that, as ruſt corrodes iron, ſo does Detraction the good-name and reputation; the rope, the abject condition of back-biters.

DEVICE,

Dejection.



Crying.



Compaſsion.



Eſteem.



Extream Deſpair.



Deſire.



Fear.

Anger mixt w.th Fear.





Fear.



DEVICE, is an emblem or repreſentation of ſome natural body, with a motto or ſentence applied, in a figurative ſenſe, to the advantage of ſome perſon; and the figure or image is called the body, and the motto the ſoul of the Device.

D. F. ſtands for Domenichino of Florence.

D. H. ſtands for David Hepſer, the brother of Lambert and of Jerome, all three German engravers.

DIAGLYPHICE, is the art of engraving, cutting, or otherwiſe working hollow or concave figures in metals; ſuch as ſeals, intaglia's, the matrices or coins for medals, &c.

DIALLING, the art of conſtructing all kinds of dials.

The reaſons on which the whole art of dialling depends, will be eaſily apprehended from the following ſhort theory:

If any terreſtrial globe be taken out of the frame, and fixed upon a pin, due north and ſouth, in any open place, the pole being elevated to the latitude, and the place of the obſerver, upon the globe, turned to the vertex, it will reſt upon its proper nadir point, and repreſent a true convex dial; on which, if meridians be drawn through every 15th degree of the equator, and marked accordingly with the correſpondent hours, it will ſhew alternately, by the interſection of light and ſhade, when the ſun ſhines upon it, the exact time of the day all the year round; alſo, to what part of the world the ſun is vertical; where it is riſing or ſetting, or in the meridian; conſequently, where it is day, night, evening, morning, noon, midnight, twilight, &c.

If ſuch a convex dial be cut by a plane, to repreſent the horizon, lines, drawn from the center to the ſeveral meridians, at the ſurface, will be the true hour lines of an horizontal dial in that latitude; and the axis, if remaining as continued, will be the gnomon. See plate XXVI, fig. 2.

In like manner will the prime vertical plane become a direct ſouth or north dial; as any other vertical plane may become an erect decliner, according as its poſition is oriental or occidental. Plate XXVII, fig. 4.

If the impreſſion of a globe be reverſed, and one half or hemiſphere, every way 90 degrees from any place, be parted into a true horizontal concave, with hour lines, azimuths, and almacanthers proper to the place; and a ſtraight pin or wire, with a ball upon it, be fixed in the pole, to repreſent the axis and center of the earth; it will, when juſtly placed, exhibit all the requiſites in Dialling, as the hour of the day, the ſun's altitude, azimuth, and declination; its amplitude, riſing, and ſetting; the length of the day, in Babyloniſh, Italian, and Jewiſh hours; and the ſun's perpendicular way over the ſeveral countries, at all times of the year.

The deſcription of the clinatory or declinatory. The declinatory

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is made of a ſquare board, as A B C D in the figure, of a good thickneſs, and the larger the better; between two of the ſides is deſcribed, on the center A, a quadrant, as E F, divided into 90 equal parts or degrees, which are figured with 10, 20, 30, to 90; and then back again, with the complements of the ſame numbers, to 90: Between the limb and the two ſemidiameters is made a round box, into which a magnetical needle is fitted, and a card of the nautical compaſs, divided into nineties, beginning their numbers at the eaſt, weſt, north, and ſouth points of the compaſs; from which points the oppoſite ſides of the clinatory receive their names of eaſt, weſt, north, and ſouth. See plate IV, fig. 1.

But note, that the north point of the card muſt be placed ſo many degrees towards the eaſt or weſt ſides of the clinatory, as the needle varies from the true north points of the world, in the place where you make the dial, which the workman who makes the clinatory will know how to fit.

Upon the center, A, whereon the quadrant is deſcribed, is faſtened a plumb-line, having a plummet of lead or braſs faſtened to the end of it, which plumb-line is of ſuch length that the plummet may fall juſt into the groove, G H, below the quadrant, which is for that purpoſe made of ſuch a depth that the plummet may ride freely within it, without ſtopping at the ſides of it. See the figure annexed.

With this clinatory you may examine the ſituation of planes; as, if your plane be horizontal, it is direct; and then, for the true ſituating your dial, you have only the true north and ſouth line to find; which is done only by ſetting the clinatory flat down upon the plane, and turning it towards the right or left hand, till you can bring the north point of the needle to hang juſt over the flower-de-lis; for then, if you draw a line by either of the ſides, parallel to the needle, that line ſhall be the north and ſouth line.

If your plane either recline or incline, apply one of the ſides of the clinatory, parallel to one of the ſemidiameters of the quadrant, to the plane, in ſuch a manner, that the plumb-line, hanging at liberty, may fall upon the circumference of the quadrant; for then the number of degrees of the quadrant, comprehended between the ſide of the quadrant, parallel to the plane, and the plumb-line ſhall be the number of degrees for reclination, if the center of the quadrant points upwards; or inclination, if the center points downwards.

If your reclining or inclining plane decline, draw upon it a line parallel to the horizon; which you may do by applying the back-ſide of the clinatory, and raiſing or depreſſing the center of the quadrant, till the plumb-line hang upon one of the ſemidiameters;

ameters; for then you muſt, by the upper ſide of the clinatory, draw an horizontal line, if the plane incline; or by the under ſide, if it recline.

If it neither incline or recline, you may draw a horizontal line both by the upper and under ſides of the clinatory.

Having drawn the horizontal line, apply the north ſide of the clinatory to it, and, if the north end of the needle points directly towards the plane, it is then a ſouth plane; if the north point of the needle point directly from the plane, it is a north plane; but, if it point directly towards the eaſt, it is an eaſt plane; if towards the weſt, a weſt plane.

If it do not point directly either eaſt, weſt, north, or ſouth, then ſo many degrees is the declination of the plane.

You may find a meridian line another way, thus: If the ſun ſhine juſt at noon, hold up a plumb-line, ſo that the ſhadow of it may fall upon your plane, and that ſhadow ſhall be your meridian line.

To deſcribe a DIAL *upon a horizontal plane.* Firſt draw a north and ſouth line, which is called a meridian line, through the middle of the plane, thus: Set your declinatory flat upon the plane, and turn it to and fro till the needle hang preciſely over the meridian line of the declinatory; then, by the ſide of the declinatory, parallel to its meridian line, draw a ſtraight line on the plane; and, if that ſtraight line be in the middle of the plane, it ſhall be a meridian line without any more to do. See plate IV, fig. 2.

But, if it be not in the middle of the plane, you muſt draw a line parallel to it, through the middle of the plane, for the meridian or XII o'clock line, and it ſhall be the meridian line, and alſo the ſubſtilar line; then draw another ſtraight line, through the middle of this line, to cut it at right angles, for the VI o'clock lines; and, where theſe two lines cut one another, make your center, whereon deſcribe a circle on your plane, as large as you can, which, by the meridian line, and the line drawn at right angles with it, will be divided into four quadrants; one of the quadrants divide into ninety degrees, thus: Keeping your compaſſes at the ſame width they were when you deſcribed the quadrant, place one foot in the XII o'clock line, and extend the other in the quadrant, and make in the quadrant a mark with it; ſo you will have the ſixtieth degree marked out; then place one foot of your compaſſes in the VI o'clock line, and extend the other in the quadrant, and make in the quadrant another mark with it; and ſo will that quadrant be divided into three equal parts, each of theſe equal parts contains thirty degrees; then with your compaſſes divide one of theſe three equal parts into three parts, and transfer that diſtance to the other two third parts of

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the quadrant; ſo ſhall the whole quadrant be divided into nine equal parts.

Then divide one of theſe nine equal parts into two equal parts, and transfer that diſtance to the other eight equal parts; and ſo ſhall the quadrant be divided into eighteen equal parts.

Then divide one of theſe eighteen equal parts into five equal parts, and transfer that diſtance to the other ſeventeen equal parts; and ſo will the whole quadrant be divided into ninety equal parts: Each of theſe ninety equal parts are called degrees.

Note, That you may in ſmall quadrants divide truer and with leſs trouble with ſteel dividers, which open or cloſe with a ſkrew for that purpoſe, than you can with compaſſes.

In this quadrant, thus divided, count, from the ſubſtilar or meridian line, the elevation of the pole; that is, the number of degrees that the pole of the world is elevated above the horizon of your place; and draw a line from the center through that number of degrees for the ſtilar line.

Then, on the ſubſtilar line, chuſe a point, where you pleaſe, and through that point draw a line at right angles to the ſubſtilar line, as long as you can, for the line of contingence; and, from that point in the ſubſtilar line, meaſure the neareſt diſtance that any part of the ſtilar line hath to that point; and, keeping one foot of your compaſſes ſtill in that point, ſet off that diſtance in the ſubſtilar line; and at that diſtance deſcribe, againſt the line of contingence, a ſemicircle, which divide, from either ſide the meridian or ſubſtilar line, into ſix equal parts, thus: Draw a line through the center of this ſemicircle, parallel to the line of contingence, which ſhall be the diametral line, and will divide this ſemicircle into two quadrants, one on one ſide the ſubſtilar line, and the other quadrant on the other ſide the ſubſtilar line.

Then, keeping your compaſſes at the ſame diſtance they were when you deſcribed the ſemicircle, place one foot, firſt on one ſide of the diametral line, at the interſection of it and the ſemicircle, and then on the other ſide, at the interſection of it and the ſemicircle, and extend the other in the ſemicircle, and make marks in the ſemicircle on either ſide the ſubſtilar line.

Then place one foot of your compaſſes at the interſection of the ſemicircle and the ſubſtilar line, and turn the other foot about on either ſide the ſemicircle, and make marks on the ſemicircle; and ſo will the ſemicircle be divided into ſix equal parts.

Divide one of theſe equal parts into two equal parts, and tranſfer that diſtance to the other five equal parts; ſo ſhall the whole ſemicircle be divided into twelve equal parts.

Theſe twelve diviſions are to deſcribe the twelve hours of the day,

day, between VI o'clock in the morning and VI o'clock in the evening.

If you will have half hours, you may divide each of theſe twelve into two equal parts, as before; if you will have quarters, you may divide each of theſe twenty-four into two equal parts more as before.

For, thus proportioning the diviſions in the ſemicircle, you may proportion the diviſions and ſub-diviſions of hours upon Dial planes; for a ſtraight ruler, laid upon each of theſe diviſions, and on the center of the ſemicircle, will ſhew, on the line of contingence, the ſeveral diſtances of all the hours and parts of hours on the Dial plane; and ſtraight lines, drawn from the center of the Dial plane, through the ſeveral diviſions on the line of contingence, ſhall be the ſeveral hour lines, and parts on the Dial plane.

But an horizontal Dial, in our latitude, will admit of four hours more, viz. V and VI in the morning, and VII and VIII in the evening.

Therefore, in the circle deſcribed on the Dial plane, transfer the diſtance between VI and V, and VI and IV on the other ſide the VI o'clock line; and transfer the diſtances between VI and VII, and VI and VIII on the other ſide the oppoſite VI o'clock hour line; and, from the center of the Dial plane, draw lines through thoſe transferred diſtances, for the hour lines before and after VI.

Then mark your hour lines with their reſpective numbers; the ſubſtilar line in this Dial, as aforeſaid, is XII; from thence, towards the right hand, mark every ſucceſſive hour line with I, II, III, &c. and, from twelve towards the left hand, with XI, X, IX, &c.

The ſtile muſt be erected perpendicularly over the ſubſtilar line, ſo as to make an angle with the Dial plane, equal to the elevation of the pole of your place.

Example: Suppoſe you would draw a Dial upon an horizontal plane here at London; firſt draw the meridian, or north and ſouth line, as XII B, and croſs it in the middle with another line at right angles, as VI VI, which is an eaſt and weſt line. Where theſe two lines cut each other, as at A, make the center, whereon deſcribe the ſemicircle B VI VI; but one of the quadrants, viz. the quadrant from XII to VI, towards the right hand, you muſt divide into ninety equal parts, as you were taught before; and make, at 51 degrees and an half, which is the latitude of London, a mark, and lay a ſtraight ruler to the center of the plane; and to this mark draw a line by the ſide of it for the ſtilar line.

Then, on the ſubſtilar line, chuſe a point, as at C, and through

that point draw a line, as long as you can perpendicularly, to the eaſt and weſt line VI VI, as E F, which is called the line of contingence, or contingent line; and, where this line of contingence cuts the ſubſtilar line, place one foot of your compaſſes, and from thence meaſure the ſhorteſt diſtance between the point C and the ſtilar line, on the ſubſtilar line, as at D; which point D ſhall be the center, whereon, with your compaſſes at the ſame width, you muſt deſcribe a ſemicircle, to repreſent a ſemicircle of the equinoctial.

Divide this ſemicircle into ſix equal parts; to each of which equal parts, and to the center of the equinoctial ſemicircle, lay a ſtraight ruler; and, where the ſtraight ruler cuts the line of contingence, make marks in the line of contingence.

Then lay a ſtraight ruler to the ſemicircle of the Dial plane, and to each of the marks in the line of contingence; and by the ſide of it draw twelve ſtraight lines, for the twelve forenoon and afternoon hour lines, viz. from VI in the morning to VI in the evening.

Then, in the quadrant VI B, meaſure the diſtance between the VI o'clock hour line and the V o'clock hour line, and tranſfer the ſame diſtance from the VI o'clock line to VII and V on both ſides the VI o'clock hour line; and through thoſe diſtances draw, from the center of the plane, the VII and V o'clock hour lines; and meaſure the diſtance between the VI o'clock hour line and the IV o'clock hour line, and transfer the ſame diſtance from the VI o'clock line to VIII and IV; and, through thoſe diſtances, draw, from the center of the plane, the VIII o'clock and IV o'clock hour lines. See plate IV, fig. 2.

If you will have the half hours and quarters, or any other diviſion of hours, you muſt divide each ſix diviſions of the equinoctial into ſo many parts as you intend, and, by a ſtraight ruler laid to the center of the equinoctial, and thoſe diviſions in the equinoctial circle, make marks in the line of contingence, as you did before for the whole hour lines; and lines, drawn from the center of the plane through thoſe marks, ſhall be the ſub-diviſions of the hours: But you muſt remember to make all the ſub-diviſions ſhort lines, and near the verge of the Dial plane, that the hours and the parts of the hours may the more eaſily be diſtinguiſhed, as you ſee in the figure.

Having drawn the hour lines, ſet the number of each hour line under it, as you ſee in the figure.

Laſt of all, fit a triangular iron, whoſe angular point being laid to the center of the Dial plane, one ſide muſt agree with the ſubſtilar line, and its other ſide with the ſtilar line; and ſo is the ſtile made.

And this ſtile muſt be erected perpendicularly over the ſubſti-

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lar line on the Dial plane, and there fix it; then is your Dial finiſhed.

To deſcribe an erect direct ſouth DIAL. You may know an erect direct ſouth plane, by applying the north ſide of the declinatory to it; for then, if the north end of the needle hang directly over the point of the card in the bottom of the box, it is a ſouth plane; but, if it hang not directly over the north point of the card, it is not a direct ſouth plane; but declines either eaſt or weſt, and that, contrary to the pointing of the needle, eaſterly or weſterly, from the north point of the card; for, if the north point of the needle points eaſterly, the plane declines from the ſouth towards the weſt; if it points weſterly, the plane declines from the ſouth towards the eaſt.

You may know, if the plane be truly erect or upright, by applying one of the ſides A B or A D fig. 1. to it; for then, by holding the center A upwards, ſo that the plumb-line may play free in the groove, if the line falls upon 0 or 90, the plane is upright; but, if it hang upon any of the intermediate degrees, it is not upright, but either inclines or reclines.

If you find that it inclines, apply the ſide A B to it, and ſee what number of degrees the plumb-line falls on; for that number of degrees, counted from the ſide A B, is the number of degrees of inclination.

If you find that the plane reclines, apply the ſide A D to it, and ſee what number of degrees the plumb-line falls on; for that number of degrees, counted from the ſide A D, is the number of degrees of reclination.

Theſe rules, being well underſtood, may ſerve for the finding the ſituation of all other planes.

But, in order to make a Dial on this plane, you muſt firſt draw a meridian line through the middle of the plane, by applying a plumb-line to the middle of it, till the plummet hang quietly before it; for then, if the plumb-line be blacked, for a white ground, or chalked, for a dark ground, and ſtrained, as carpenters do their lines, you may with one ſtroke of the ſtring on the plane deſcribe the meridian line, as A XII in plate IV, fig. 3.

Then, on the top of this meridian line, as at A, draw another line acroſs it, to cut it at right angles, as VI VI, for an eaſt and weſt line.

At the meeting of theſe two lines at the top, make your center, on which deſcribe a ſemicircle on your plane, as large as you can, which, by the meridian line, and the eaſt and weſt line, will be divided into two quadrants.

One of theſe quadrants divide into ninety degrees, as is before taught, and, from the ſubſtilar line, count the complement

of the elevation of the pole, which, here at London, where the pole is elevated 51 degrees and an half, its complement to 90 is 38 degrees and an half; and there make a mark, as at E.

Then, on the ſubſtilar line, chuſe a point, where you pleaſe, as at F, for the line of contingence to paſs through; which line of contingence draw as long as you can, ſo that it may cut the ſubſtilar line at right angles; and from the point F, in the ſubſtilar line, meaſure the ſhorteſt diſtance between it and the ſtilar line, and, keeping one foot of your compaſſes ſtill in the point F, transfer that diſtance into the ſubſtilar line, as at G; then, on the point G, deſcribe a ſemicircle of the equinoctial againſt the line of contingence, which ſemicircle divide into twelve equal parts, as is taught in the example of the horizontal Dial, and, by a ſtraight ruler laid to each of theſe diviſions, and to the center of the ſemicircle, make marks in the line of contingence by the ſide of the ruler; for ſtraight lines drawn from the center of the Dial plane, through theſe marks in the contingent line, will be the twelve hour lines before and after noon.

Then mark your hour lines with their reſpective numbers; the ſubſtilar or meridian line is XII; from thence towards the right hand with I, II, III, &c. and from thence towards the left hand with XI, X, IX, &c.

The ſtile muſt be erected pependicularly over the ſubſtilar line, ſo as to make an angle on the Dial plane, equal to the complement of the elevation of the pole, viz. 38 degrees and an half.

To make an erect direct north DIAL. The erect direct north Dial, ſtile and all, is made by the ſame rules, changing upwards for downwards, and the left ſide for the right, that the erect direct ſouth Dial is made.

For, if the erect direct ſouth Dial be drawn on any tranſparent plane, as on glaſs, horn, or oiled paper, and the horizontal line VI VI turned downwards, and the line VII marked with V, and the line VIII with IV, and the line V with VII, and the line IV with VIII; then you will have of it a north erect dial.

All the other hour lines in this Dial are uſeleſs, becauſe the ſun in our latitude ſhines on a north face, the longeſt day, only before VI in the morning and after VI in the evening.

To deſcribe an erect direct eaſt DIAL. Hang a plumb-line a little above the place on the wall, where you intend to make your Dial, and wait till it hang quietly before the wall; then, if the line be rubbed with chalk, as the carpenters do, you may, by holding the end of the plummet line cloſe to the wall, and ſtraining it pretty ſtiff, ſtrike with it a ſtraight line, as carpenters

ters do; this line will be a perpendicular, as A B. See plate V, fig. 1.

Then chuſe a convenient point in this perpendicular, as at C, for a center, whereon deſcribe an occult arch, as at D E; this arch muſt contain the number of degrees of the elevation of the equinoctial, counted between D and E, which in our latitude is 38 degrees and an half, or, which is all one, the complement of the elevation of the pole.

Therefore, in a quadrant of the ſame radius with the occult arch, meaſure 38 degrees and an half, and ſet them off in the plane from E to D; then, from D to the center C in the perpendicular, draw the pricked line D C; and this pricked line will repreſent the axis of the world.

Then croſs this line at right angles with the line C F, and draw it off from C to F, as long as you poſſibly can, and this line will be the contingent line.

Then chuſe a point in this contingent line, as at VI, and draw a line through that point at right angles, for the ſubſtilar line, as G VI H; then open your compaſſes to a convenient width as to VI G, and, pitching one foot in the point G, with the other foot deſcribe a ſemicircle of the equinoctial, againſt the line of contingence; which ſemicircle divide from VI, both ways, into ſix equal parts, as you were taught by the example in the horizontal Dial; and, laying a ſtraight ruler on the center of this ſemicircle of the equinoctial, and to each of thoſe equal parts, mark on the contingent line, where the ruler cuts it; for thoſe marks ſhall be the ſeveral points, from whence lines, drawn parallel to the line C D, ſhall be the reſpective hour lines. See plate V, fig. 1.

The reaſon why the contingent line is drawn from VI to F ſo much longer than from VI to C, is becauſe the hour lines from VI to XII are more in number towards noon, than they are from VI backwards towards IV; for this Dial will only ſhew the hours from a little before IV in the morning to almoſt noon; for juſt at noon the ſhadow goes off the plane, as may may be ſeen by applying a ſtraight ruler to the center of the equinoctial ſemicircle G, and lay to it the point XII in the ſemicircle; for then the ſtraight ruler will never cut the line of contingence, becauſe the line of contingence is parallel to the line G XII on the equinoctial circle; and lines parallel, though continued to never ſo great a length, never meet.

To theſe hour lines put figures, as you ſee, plate V, fig. 1.

The ſtile, I K, of this Dial, as well as of all others, muſt ſtand parallel to the axis of the world; and alſo parallel to the face of the plane, and parallel to all the hour lines, and ſtand directly over the ſubſtilar or VI o'clock hour line, and that ſo high, as

is the diſtance of the center of the equinoctial ſemicircle from the contingent line.

To deſcribe a DIAL *on an erect direct weſt plane.* An erect direct weſt Dial is the ſame in all reſpects with an erect direct eaſt Dial, only, as the eaſt Dial ſhews the forenoon hours, ſo the weſt ſhews the afternoon hours.

Thus, if the eaſt Dial were drawn on any tranſparent plane, as on glaſs, horn, or oiled paper, on the one ſide will appear an eaſt Dial, and on the other ſide a weſt; only the numbers to the hour lines, as was ſaid before as to the north Dial, muſt be changed; for that, which in the eaſt Dial is XI, in the weſt muſt be I; that, which in the eaſt Dial is X, in the weſt muſt be II; that, which in the eaſt Dial is IX, in the weſt muſt be III, &c. The ſtile is the ſame.

To deſcribe a DIAL *on an erect north or ſouth plane, declining eaſtward or weſtward.* Plate IV, fig. 4. Theſe four Dials, viz. the erect north, declining eaſtward; the erect north, declining weſtward; the erect ſouth, declining eaſtward; and the erect ſouth, declining weſtward, are all projected by the ſame rules, and therefore are in effect but one Dial, differently placed, as you will ſee hereafter.

Firſt, draw on your plane a ſtraight line, to repreſent the horizon of your place, and mark on one end of it W. for weſt, and on the other end E. for eaſt.

Then chuſe a point in this horizontal line for a center, as at A, on which you may deſcribe a circle, to comprehend all theſe four Dials; draw a line, as M A M, perpendicular to the horizontal line W E through the center A for a meridian line, and on that center deſcribe a circle, which, by the two lines W A E, and M A M, will be divided into four quadrants, which will comprehend the four Dials aforeſaid; for, if it be a north, declining weſt, you are to draw, the upper quadrant on the left hand ſerves your purpoſe; if a ſouth, declining weſt, the ſame lines, continued through the center A into the lower quadrant to the right hand, ſerves your turn; if a north, declining eaſt, the upper quadrant to the right hand ſerves your turn; or, if a ſouth, declining eaſt, the ſame lines, continued through the center A into the lower quadrant to the left hand, ſerves your turn; and you muſt draw the declination, complement of the poles, altitude, ſubſtile, ſtile, and hour lines in it; but the hour lines muſt be differently marked, as you will ſee hereafter.

I ſhall only give you an example of one of theſe Dials, viz. a ſouth declining eaſt.

We will ſuppoſe you are to draw a Dial that declines from the ſouth 50 degrees towards the eaſt; here being but one Dial, you need deſcribe but one quadrant of a circle. Plate IV, fig 4.

Set

Set off in the lower quadrant W A M, 50 degrees from the meridian line, M towards W, and from the center A draw a ſtraight line, through that mark in the quadrant, as D A, which may be called the line of declination; then ſet off from the meridian line the complement of the pole's elevation, which in our latitude is 38 degrees and an half, and there draw another line from the center to AP, which we will call the polar line.

Then take in the horizontal line a convenient portion of the quadrant, as A B, and from the point B draw a line parallel to the meridian line A M, and continue that line till it interſect the polar line, as at P; from which point P draw a line parallel to W A, as P C; then meaſure the diſtance of A B in the horizontal line, and ſet off that diſtance in the line of declination, as from A to D; and from that point of diſtance draw a line parallel to the meridian A M, through the horizontal line at R, and through the point D, and continue it through the line P C, as at S; then, laying a ſtraight ruler to the center A, and the interſection of the line P at S, draw the line A S for the ſubſtile.

Then upon the point S erect a line perpendicularly, as S T; then meaſure the diſtance between R and D, and ſet that diſtance off from S to T; and from the center to the point T draw the line A T for the ſtile or gnomon; and the triangle S A T, made of iron or braſs, and erected perpendicularly over the ſubſtile S A, ſhall, by its upper ſide T A, caſt a ſhadow upon the hour of the day.

But you will ſay the hour lines muſt be drawn firſt; it is true: Therefore to draw them you muſt chuſe a point in the ſubſtile line, where you think good, and through it draw the line F F, as long as you can, for the line of contingence; then with your compaſſes take the ſhorteſt diſtance between this point and the ſtile, and transfer that diſtance below the line of contingence on the ſubſtile, as at Æ or A E; and with your compaſſes at that diſtance deſcribe on the center Æ a circle to repreſent the equinoctial; then, as you were taught in the example of the horizontal Dial, divide the ſemicircle of the equinoctial into twelve equal parts, beginning at the poiut in the equinoctial circle, where a ſtraight line, drawn from the center of it to the interſection of the line of contingence with the meridian line, cuts the equinoctial line, as here at the point G; then lay a ſtraight ruler to the center of the equinoctial circle, and to every one of the diviſions in the ſemicircle, and mark where the ſtraight ruler cuts the contingent line; for ſtraight lines, drawn from the center A of the Dial to thoſe ſeveral marks on the contingent line, ſhall be the hour lines; and muſt be numbered from the noon line or meridian A M, backwards, as XII, XI, X, IX, &c. towards the left hand; ſo is your Dial finiſhed.

This Dial, drawn on any tranſparent matter, as glaſs, horn, or oiled paper, ſhall, on the other ſide the tranſparent matter, become a ſouth declining weſt, ſtile and all, but then the I o clock hour line muſt be marked II; the XII XII; the XI o'clock hour hour line I; X II; IX III, &c.

If you project it anew, you muſt deſcribe the quadrant M W, on the other ſide the meridian line, on the center A, from M to E, and then count, as before, the declination, altitude of the poles, ſubſtile and ſtile in the quadrant, beginning at M towards E, and work in all reſpects as in the ſouth declining eaſt; only number this ſouth declining weſt, as in the foregoing paragraph.

If you project a north declining eaſt, you muſt deſcribe the quadrant above the horizontal line, from M upwards towards E on your right hand, and count, as before, the declination, altitude, complement of pole, ſubſtile and ſtile from the meridian line, and work as with the ſouth declining eaſt; it muſt be numbered from the meridian line M, towards the right hand, with XI, X, IX, VIII, &c.

If this Dial were drawn on a tranſparent matter, the other ſide would ſhew a north declining weſt; but, if you will project it anew, you muſt deſcribe the quadrant above the horizontal line, from M upwards towards W, and count, from the meridian line A M, the declination, complement, altitude of the pole, ſubſtile and ſtile, and work with them, in all reſpects, as with the ſouth declining eaſt; but then the XI o'clock hour line muſt be marked I; the X II; the IX III, &c.

To make a DIAL *on the cieling of a room, where the direct beams of the ſun never come.* Find ſome convenient place, in the tranſum of window, to place a ſmall round piece of looking-glaſs, about the bigneſs of a groat, or leſs, ſo as it may lie exactly horizontal.

The point in the middle of this glaſs we will mark A, and, for diſtinction ſake, will call it nodus. See plate V, fig. 3.

Through this nodus you muſt draw a meridian line on the floor, thus: Hang a plumb line in the window, exactly over the nodus, and the ſhadow that the plumb-line caſts on the floor, juſt at noon, will be a meridian line; or you may find a meridian line otherwiſe by the clinatory.

Having drawn the meridian line on the floor, find a meridian line on the ceiling, thus: Hold a plumb-line to the ceiling, over that end of the meridian line next the window; if the plummet hang not exactly on the meridian line on the floor, remove your hand on the ceiling one way or other, as you ſee cauſe, till it do hang quietly juſt over it; and, at the point where the plumb-line touches the ceiling, make a mark, as at B; that mark B ſhall be directly over the meridian line on the floor. Then remove your

plumb-

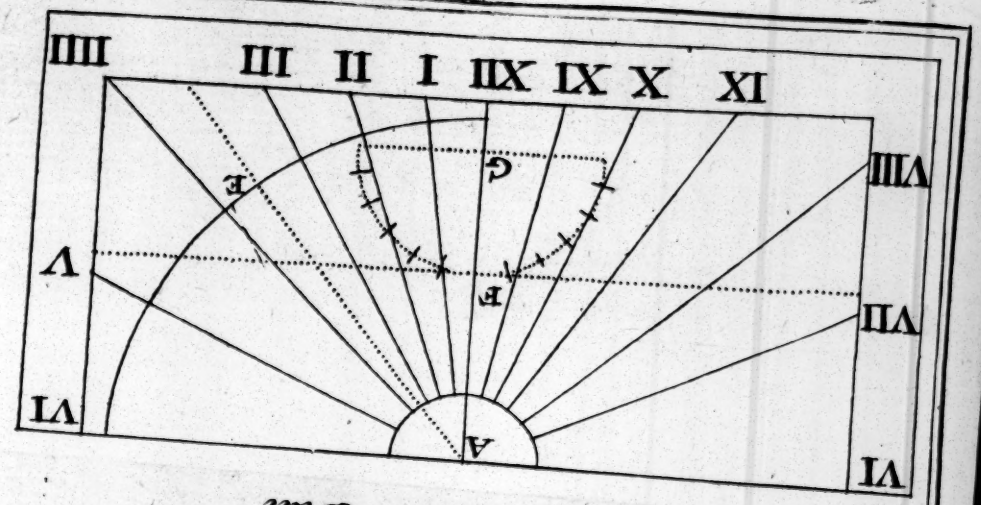


Fig. 3.
An erect South Dial

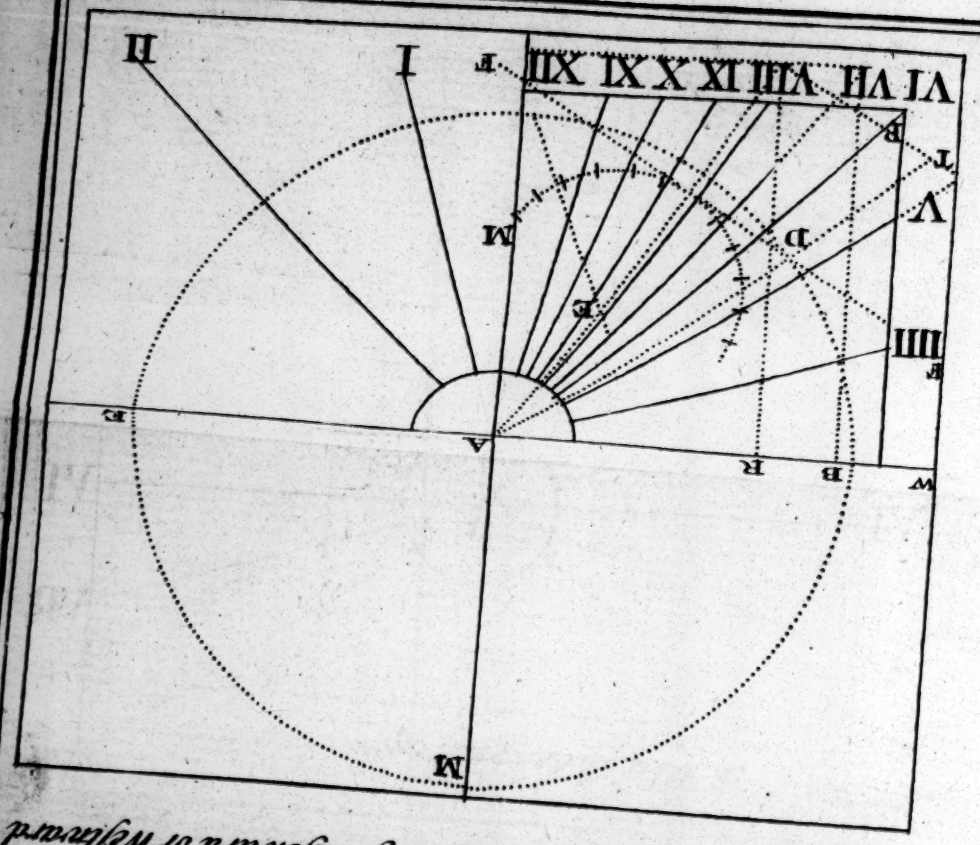


Fig. 4.
An erect North or South dial declining Eastward or Westward

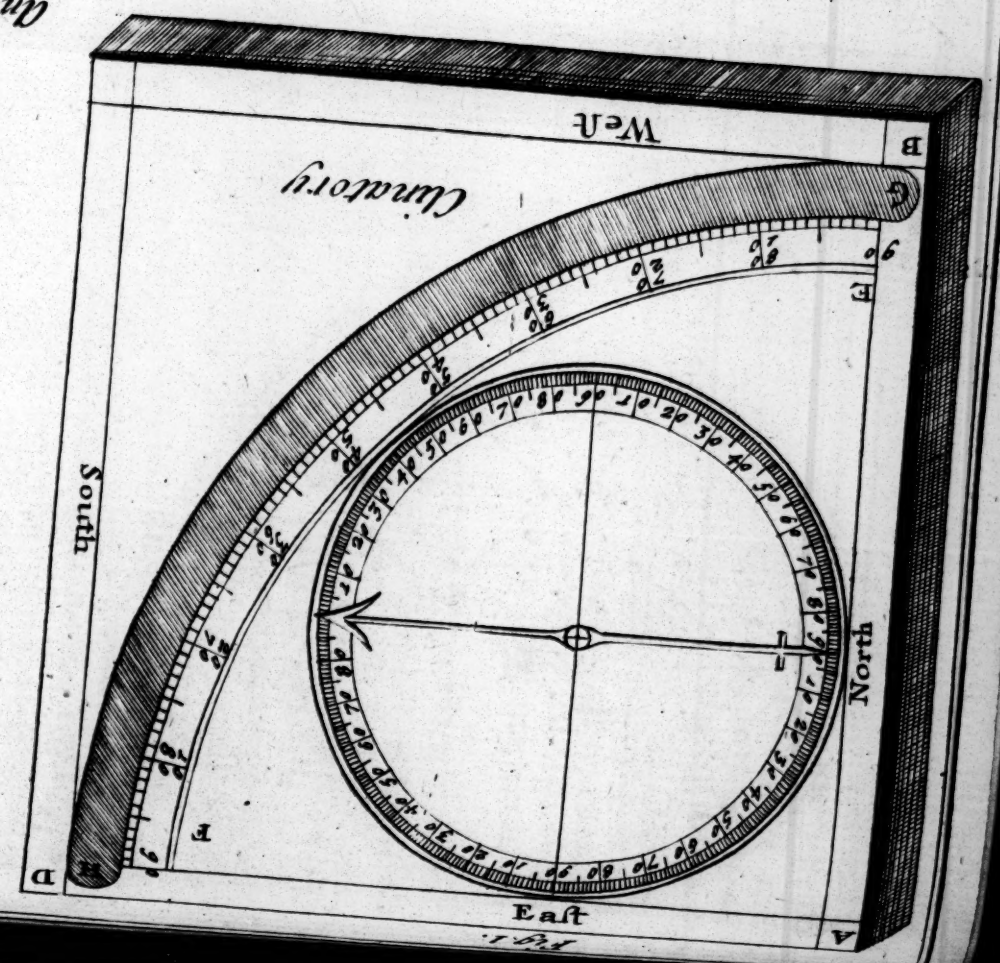


Fig. 1.

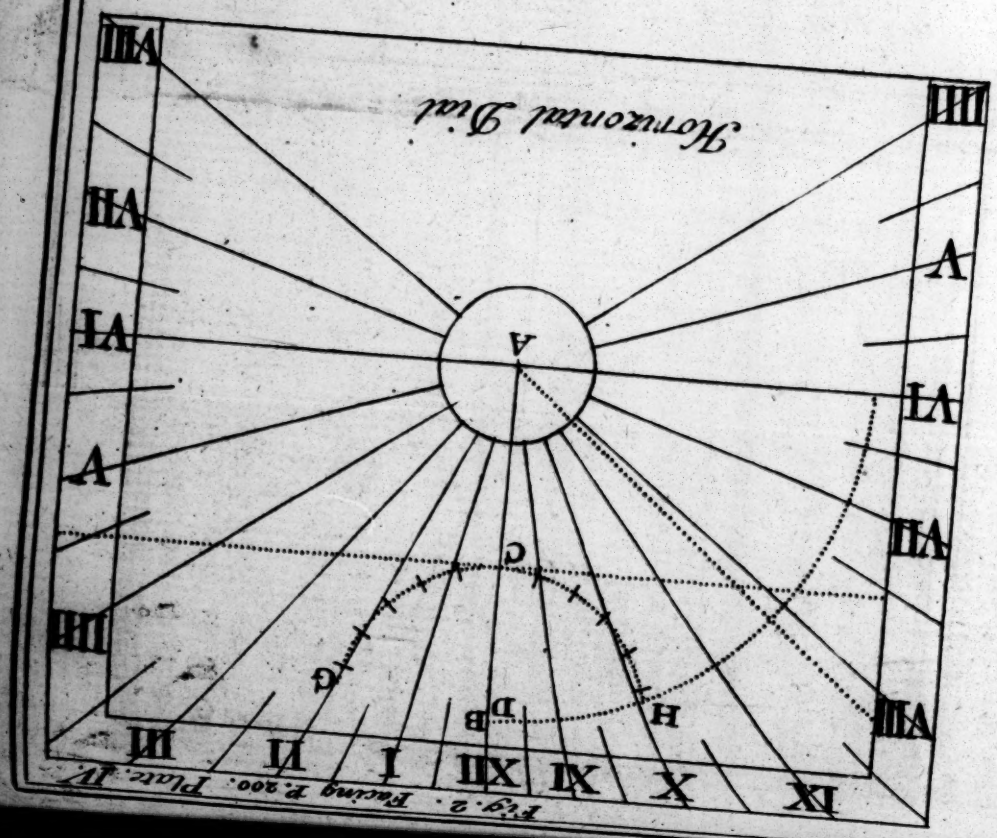
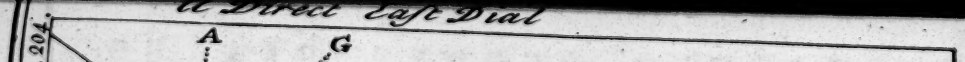
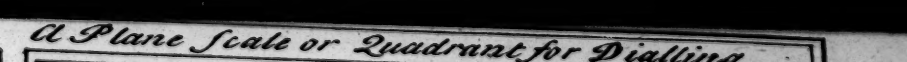


Fig. 2. Facing P. 200. Plate. IV

A Direct East Dial



A Plane Scale or Quadrant for Dialling



A Direct East Dial

Facing p. 204.

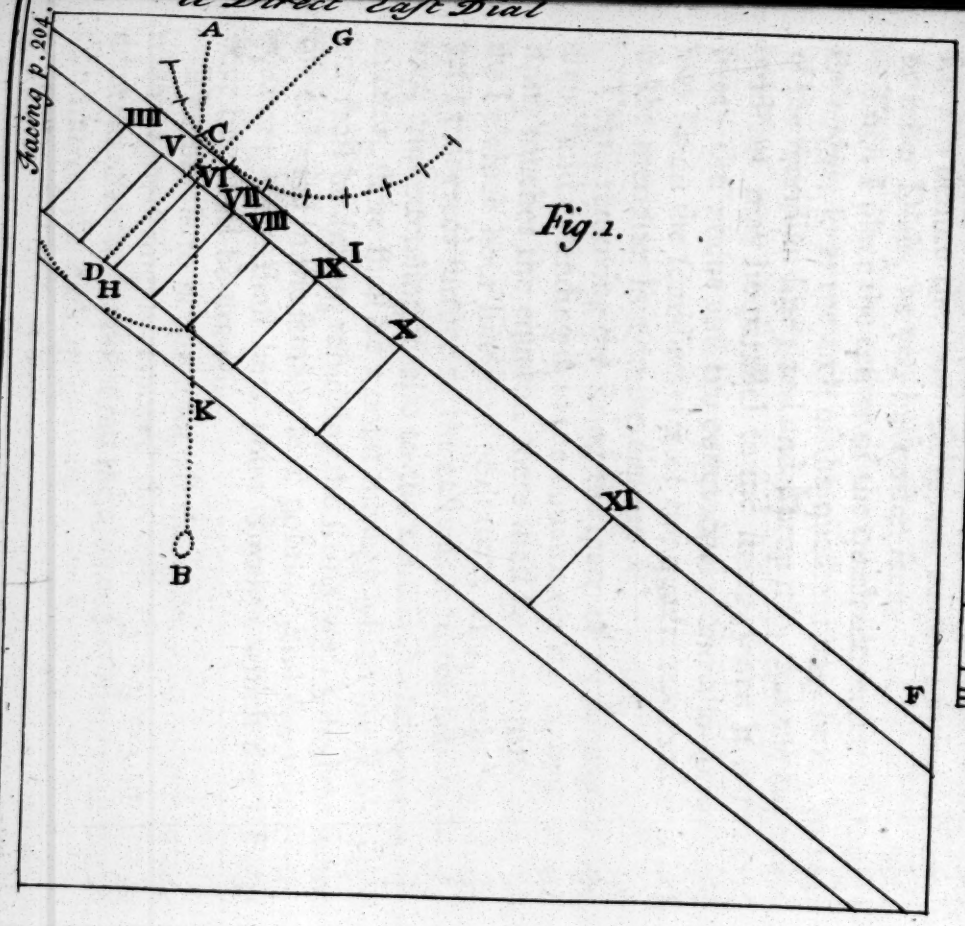


Fig. 1.

A Plane Scale or Quadrant for Dialling

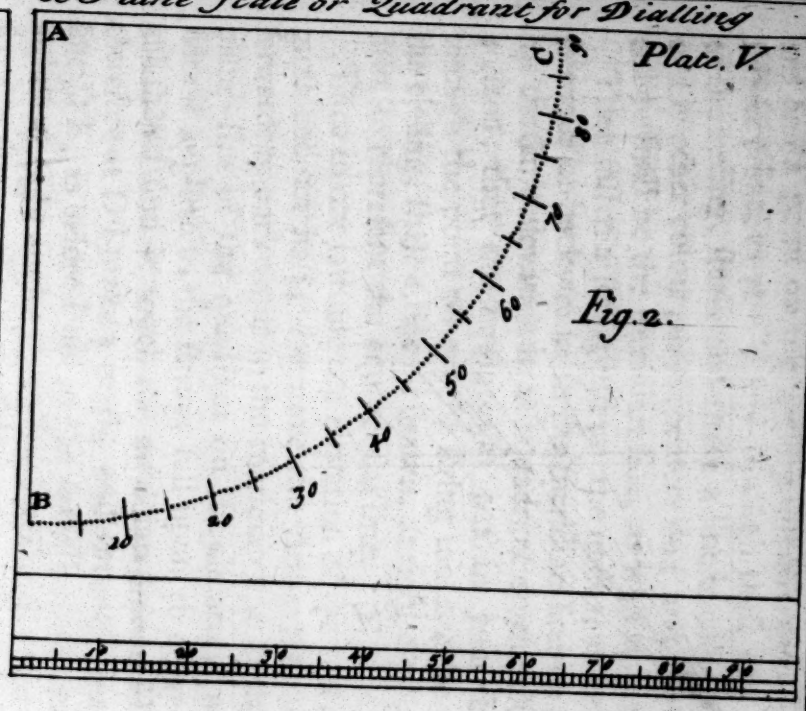


Fig. 2.

Dial on the Ceiling of a Room, where the direct Rays of the Sun never come.

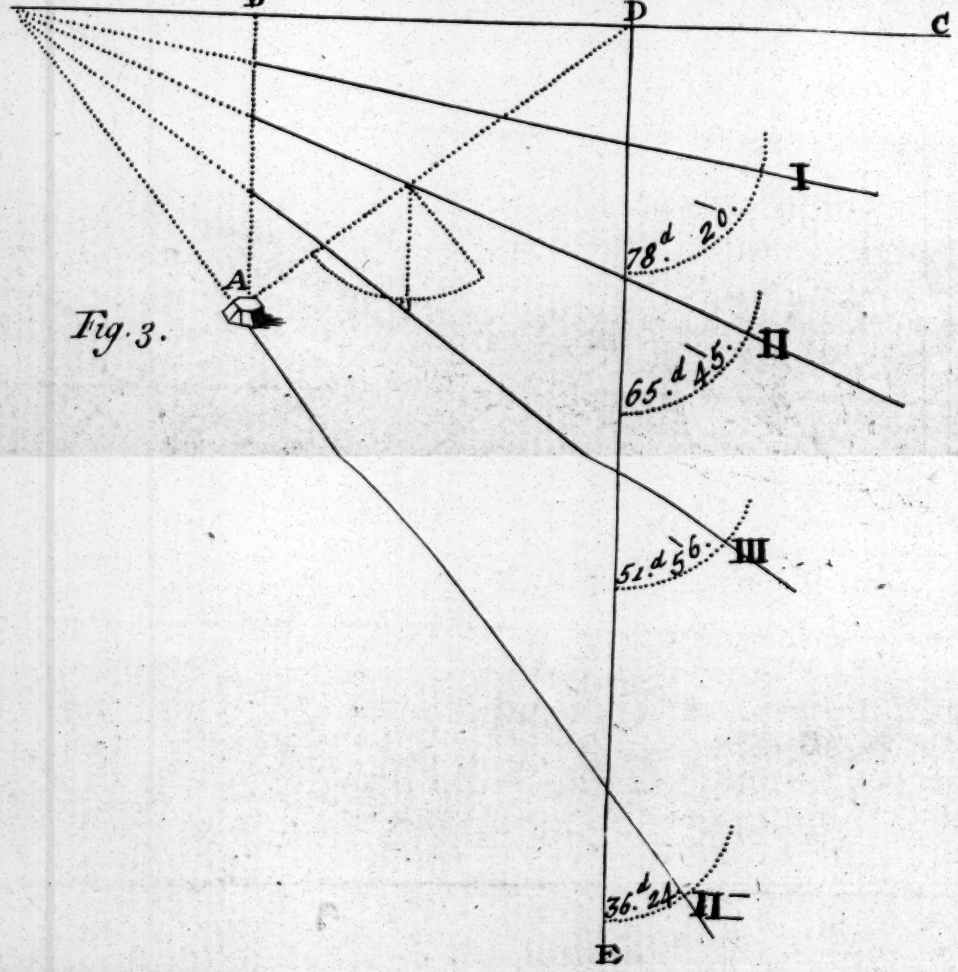


Fig. 3.

A Dial declining far Eastward or Westward

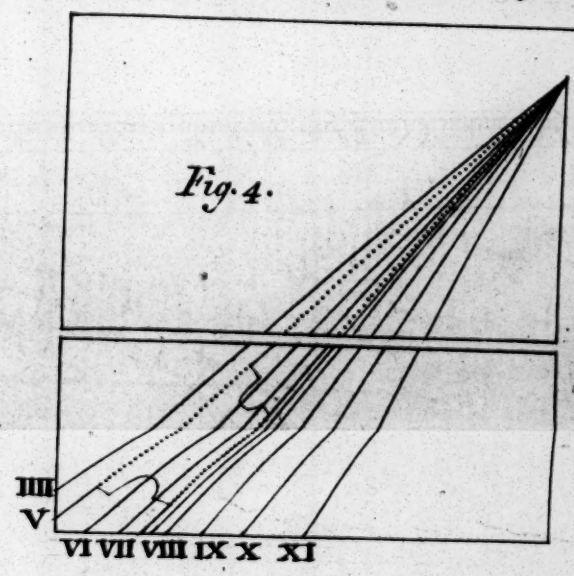
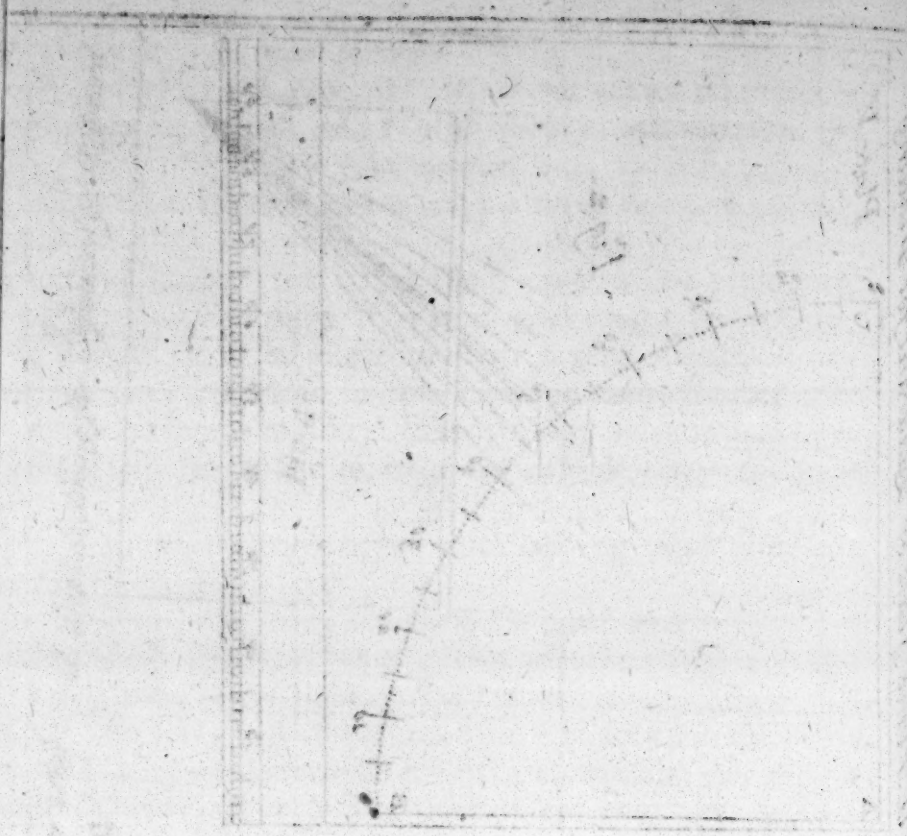
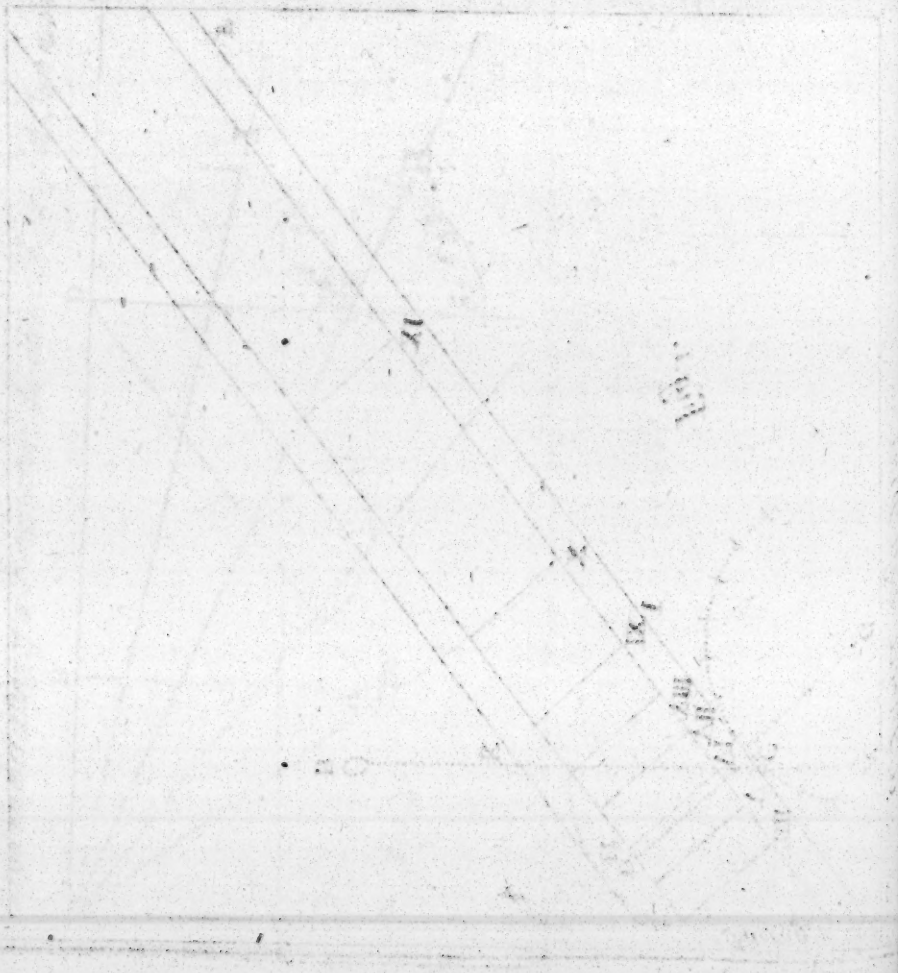


Fig. 4.





plumb-line to the other end of the meridian line on the floor, and find a point on the cieling directly over it, as you did the former point, as at C; and through theſe two points B and C, on the cieling, ſtrain and ſtrike a line blacked with a ſmall-coal or any other colour, as carpenters do; and that line B C on the ceiling ſhall be the meridian line, as well as that on the floor.

Then faſten a ſtring juſt on the nodus, and remove that ſtring forwards or backwards, in the meridian line on the cieling, till it has the ſame elevation in the quadrant on the clinatory above the horizon, that the equinoctial has in your habitation; and, through the point where the ſtring touches the meridian line on the cieling, ſhall a line be drawn, at right angles with the meridian, to repreſent the equinoctial line.

Thus in our latitude the elevation of the equator being 38 degrees and an half; I remove the ſtring faſtened to the nodus forwards or backwards in the meridian line of the cieling, till the plumb-line of the quadrant on the clinatory, when one of the ſides is applied to the ſtring, fall upon 38 degrees and an half; and then I find it touch the meridian line at D in the cieling; therefore at D I make a mark, and through this mark ſtrike the line D E, as before I did in the meridian line, to cut the meridian line at right angles; this line ſhall be the equinoctial line, and ſerve to denote the hour diſtances, as the contingent line does on other Dials, as you have often ſeen.

Then I place the center of the quadrant on the clinatory upon the nodus, ſo as the arch of the quadrant may be on the eaſt part of the meridian line; and under prop it ſo, that the flat ſide of the quadrant may lie parallel to the ſtring, when it is ſtrained between the nodus and the equinoctial; and alſo ſo as the ſtring may lie on the ſemidiameter of the quadrant, when it is held up to the meridian line on the cieling.

Then, removing the ſtring the ſpace of 15 degrees in the quadrant, and extending it to the equator on the cieling, where the ſtring touches the equator, there ſhall be a point through which the I o'clock hour line ſhall be drawn; and, removing the ſtring yet 15 degrees further to the eaſtward, in the ſemicircle of poſition, and extending it alſo to the equator, where it touches the equator, there ſhall be a point through which the II o'clock hour line ſhall be drawn, removing the ſtring yet 15 degrees further to the eaſtward in the ſemicircle of poſition, and extending it to the equator; there ſhall be a point through which the III o'clock hour line ſhall be drawn.

The like is to be done for all the other afternoon hours. So often as the ſtring is removed through 15 degrees on the quadrant, ſo often will it point out the afternoon diſtances in the meridian line on the cieling.

Having

Having thus found out the points in the equator, through which the afternoon hour lines are to be drawn, you may find the forenoon hour diſtances alſo, the ſame way, viz. by removing the arch of the quadrant to the weſt ſide the meridian, as before it was placed on the eaſt, and bringing the ſtring to the ſeveral 15 degrees on the weſt ſide the quadrant; or, otherwiſe, you need only to meaſure the diſtances of each hour's diſtance, found in the equator from the meridian line on the cieling; for the ſame number of hours from XII have the ſame diſtance in the equinoctial line on the other ſide the meridian, both before and after noon.

The XI o'clock hour diſtance is the ſame from the meridian line, with the I o'clock diſtance on the other ſide the meridian; the X o'clock diſtance the ſame with the II o'clock diſtance; the IX with the III, &c. and thus the diſtances of all the hour lines are found out on the equator. See plate V. fig. 3.

Now, if the center of this Dial lay within doors, you might draw lines from the center through theſe pricks in the equator, and thoſe lines ſhould be the hour lines, as in other Dials; but the center of this Dial lies without doors in the air, and therefore not convenient for this purpoſe; ſo that, for drawing the hour lines, you muſt conſider what angle every hour line in an horizontal Dial makes with the meridian; that is, at what diſtance, in degrees and minutes, the hour lines of an horizontal Dial cut the meridian; which you may examine as by operation 2; for an angle, equal to the complement of the ſame angle, muſt each reſpective hour line with the equator on the cieling have.

Thus, upon the point marked for each hour diſtance in the equinoctial line on the cieling, deſcribe the arches I, II, III, IV, as in the figure; and, finding the diſtance from the meridian of the hour lines of an horizontal Dial to be according to operat. 2. thus,

The $\left\{\begin{matrix}1\\2\\3\\4\end{matrix}\right\}$ hour line $\left\{\begin{matrix}11,40\\24,15\\38,14\\53,36\end{matrix}\right\}$ whoſe complement to 90 is $\left\{\begin{matrix}78,20\\65,45\\51,56\\36,24\end{matrix}\right\}$

I meaſure in a quadrant the ſame radius with thoſe arches already drawn from the equinoctial line.

For the $\left\{\begin{matrix}1\\2\\3\\4\end{matrix}\right\}$ o'clock hour $\left\{\begin{matrix}78,20\\65,45\\51,56\\36,24\end{matrix}\right\}$

And transfer theſe diſtances to the arches drawn on the cieling; for then ſtraight lines, drawn through the mark in the arch, and through the mark in the equator, and prolonged both ways to a convenient length, ſhall be the ſeveral hour lines, aforeſaid, and,

and, when the ſun ſhines upon the glaſs at the nodus, its beams will reflect upon the hour of the day.

Some helps to a young dialiſt, for his more orderly and quick making of DIALS. See plate V, fig. 2.

It may prove ſomething difficult, to thoſe that are unpractiſed in mathematical projections, to divide a circle into 360 degrees, or, which is all one, a ſemicircle into 180, or a quadrant into 90 degrees.

The ſpeedieſt way of doing which is by a line of chords, which, if you will be curious in your practice, you may make yourſelf; or, if you account it not worth your while, you may buy it already made on box or braſs, of moſt mathematical inſtrument makers.

This inſtrument they call a plain ſcale, which does not only accommodate you with the diviſions of a quadrant, but alſo ſerves for a ruler to draw ſtraight lines with.

The manner of making it is as follows:

Deſcribe upon a ſmooth, flat, even-grained board a quarter of an whole circle, as B C, whoſe radius A B, or A C, may be four inches, if you intend to make large Dials; or two inches, if ſmall; but, if you will, you may have ſeveral lines of chords on your ſcale or rule.

Divide this quadrant into ninety equal parts, as you are taught in the making the horizontal Dial.

Then draw cloſe by the edge of your ſtraight ruler a line parallel to the edge, and at about one twentieth part of an inch a ſecond line parallel to that, and at about one eighth of an inch a third line parallel to both.

Then place one foot of your compaſſes at the beginning of the firſt degree on the quadrant deſcribed, on the board, as at B, and open the other foot to the end of the firſt degree, and tranſfer that diſtance upon your rule, from B to the firſt mark or diviſion, between the two firſt drawn lines.

Then place one foot of your compaſſes again at the beginning of the firſt degree on the quadrant deſcribed, on the board, as at B, and open the other foot to the end of the ſecond degree, and transfer that diſtance upon your rule, from B to the ſecond mark or diviſion, between the two firſt drawn lines; and thus meaſure the diſtance of every degree from the firſt degree deſcribed on the quadrant, and transfer it to the rule.

But, for diſtinction ſake, you may draw every tenth diviſion from the firſt line parallel to the edge of the third line, and mark them in ſucceſſion from the beginning with 10, 20, 30, to 90; and the fifth diviſions you may draw half way, between the ſecond and third parallel lines; the ſingle diviſions only between the two firſt parallel lines. So is your line of chords made.

The

The uſe of the line of the chords. As its uſe is very eaſy, ſo is its convenience very great, for, placing one foot of the compaſſes at the firſt diviſion on the ſcale, and opening the other to the ſixtieth degree, you may with the points of your compaſſes, ſo extended, deſcribe a circle, and the ſeveral diviſions on the ſcale ſhall be the degrees of the four quadrants of that circle, as you may try by working backwards, to what you were juſt now taught in the making the ſcale; for, as before you meaſured the diſtance of the degrees of the quadrant, and tranſferred them to the ſcale; ſo now you only meaſure the diviſions on the ſcale, and transfer them to the quadrant, ſemicircle, or whole circle, deſcribed on your paper. For example,

If you would meaſure thirty degrees in your deſcribed circle, place on the foot of your compaſſes at the beginning of the diviſions on the ſcale, as at A, and extend the other foot to the diviſion marked thirty, and that diſtance, transferred to the circle, ſhall be the diſtance of thirty degrees in that circle.

Do the like for any other number of degrees.

You may draw your Dial firſt on a large ſheet of paper, if your Dial plane be ſo large; but, if it is not ſo large, draw it on a ſmaller piece of paper; then rub the backſide of your paper Dial with ſmall-coal, till it be well blacked; and laying your paper Dial on the Dial plane, ſo that the lines of your paper agree with the eaſt, weſt, north, and ſouth ſituation of your Dial plane.

Then with wax or pitch faſten the corners of the paper on the plane, and, laying a ſtraight ruler on the hour lines of your Dial, draw with the blunted point of a needle, by the ſide of the ruler, and the ſmall-coal rubbed on the backſide the paper will leave a mark of the lines on the plane.

If you would have the lines drawn red, you may rub the backſide of your paper with vermilion; if blue, with verditer; if yellow, with orpiment, &c.

Then draw upon theſe marked lines with oil colours, as you pleaſe.

If your Dial decline far towards the eaſt or weſt, the hour lines, unleſs projected to a very great length, will run very cloſe to one another; therefore in this caſe you muſt project your Dial on a large table, or ſometimes on the floor of a room, and cut it off as far as you think good from the center; for, the further from the center, the larger the diſtance of the hour lines. See plate V, fig. 4.

Of painting ſun DIALS, *and firſt of the planes on which Dials are to be drawn.*

Dial planes are of two ſorts; firſt, ſuch as are made on the wall of a building; or, ſecondly, ſuch as are drawn on tables of wood, vulgarly called Dial boards.

The

The firſt ſort, if they are made on brick-work, is done by plaiſtering on the wall with lime, ſand, and hair, mixed; this, if well drenched with linſeed oil, after it is dry, or as long as it will drink in any, and then with oil and white lead, may be durable enough.

But a better way is to temper the lime, ſand, and hair with ox blood, which will be no great charge, but of great advantage; for this mixture will equal in time the hardneſs of a free-ſtone, and keep the ſurface as free from the injuries of weather; but you muſt afterwards paint it white.

If you were to work on a ſtone, the beſt way is to drench the ſtone with linſeed oil and white very thin, till it will drink in no more; then ſhall the Dial you paint upon it, laſt longer and be the better prepared againſt the ruins of time.

Now for tables or Dial planes of wood, they being the moſt common, I ſhall give ſuch directions for making them, as have been always found moſt profitable and fit for the purpoſe.

The beſt woods, for this purpoſe, are the cleareſt oak and the reddeſt fir, provided it be not turpentiny; there is not much difference between theſe two woods, as to their alteration by the weather; they being both ſubject to ſplit in caſe they are bound, and have not free liberty to ſhrink with dry weather, and ſwell with wet; though, as to their laſting, oak ſeems preferable; but good red fir will laſt the age of an ordinary man, if well ſecured, as things of this nature ought to be.

In working either of theſe kinds of woods, the boards ought firſt to be cut to ſuch a length as you intend your Dial board ſhall be, and ſo many of them as may make up the breadth deſigned, and let them be jointed on the edges, and placed on both ſides, and afterwards ſet to dry.—For it has been obſerved, that, though boards have lain in a houſe ever ſo long, and are ever ſo dry, yet, when they are thus ſhot and plained, they will ſhrink afterwards beyond belief, if kept dry.

When you think they are dry enough, and will ſhrink no more, let them be ſhot again with good joints, and let every joint be ſecured with good dove-tails, let in croſs the joint in the backſide. Let this be done when the boards are glued together and well dried.

After it has been thus glued, and the joints are ſufficiently dry, then let the face of the board be well planed and tried every way, that it may be both ſmooth and true, and the edges ſhot true, and all of a thickneſs, as pannels of wainſcot are commonly wrought.

The edges muſt be thus true and even, that they may fit into the rabbit of a moulding, put round it, juſt as a pannel of wainſcot does in its frame.

This will give liberty to the board to ſhrink and ſwell without tearing, whereas mouldings that are nailed round the edge, as the common way is, do ſo reſtrain the motion of the wood, that it cannot ſhrink without tearing. But boards, made this way, will laſt a long time, without either parting in the joints or ſplitting in the wood.

Dials are ſometimes drawn on planes lined with copper or lead, that they may be free from ſplitting or tearing; but a board, made as before directed, is to be preferred in many reſpects. As, firſt, in that it is much cheaper. Secondly, both lead and copper too will ſwell a little with the heat of the ſun, and in time will grow hollow outwards, or convex inſtead of a perfect flat, which will much pervert the truth of its ſhadow. And, thirdly, the colours will be apt to peel from the metal, and the Dial will by that means be in danger to be ſooner defaced, than if it were painted upon a wooden plane.

How to make the beſt glue for gluing the joints of DIAL *boards.* Take a quart of water, ſet it on the fire, put into it about half a pound of good glue, and boil them gently together over a gentle fire, till the glue be wholly diſſolved, and of a due conſiſtence, that it may not be too thin; for, if it be, the wood will ſo drink it up that it will not be of a ſufficient body to bind the parts together; on the contrary, if it be too thick, it will not give way for the joint to ſhut cloſe enough to be ſtrongly joined; for, though it is glue that makes the joints ſtick, yet where there is ſo much of it, that the joint cannot cloſe exactly, it will never hold firmly.

Whenever you come to uſe glue, take care that it be firſt thoroughly hot, for glue that is not hot, never takes firm hold on the wood.

You muſt alſo take great care that the boards you are to glue have not been touched with oil or greaſe, for in ſuch places the glue will never take hold.

Although, after a thing is once glued faſt, no greaſe nor oil can hurt it.

The glue being ready, and the joints of the boards ſhot true, ſet both the faces of the joint cloſe together, and both alſo turned upwards; then dip a bruſh in the glue, and beſmear the faces of both joints, as quick as poſſible; then clap the two faces of the joint together, and ſlide or rub them long ways one upon another two or three times to ſettle them cloſe, and ſo let them ſtand till they are firm and dry.

Colours requiſite for painting a ſun DIAL. Four colours are ſufficient for this work, viz. Spaniſh brown for the firſt or priming colour.

2. White

2. White lead for the ſecond colour, and finiſhing the face of the table.

3. Vermilion for drawing the hour lines.

4. Lamp-black for the figures in the margin, reſpecting the lines of every hour, if it be a plane Dial.

But, if you would have your figures gilded, then ſome other materials are required, as gold and the ſize to lay it on, and ſmalt for a blue ground, if you intend a rich colour; but ſome lay the ground where the figures are gilt with vermilion, and that looks well, if the figures are liſted with black, and a black moulding round the Dial.

The practice of painting ſun DIALS. When, according to the rules before given, you have drawn on paper the draught of your Dial, and your board be ready, and colours prepared, you muſt next proceed as follows:

Take Spaniſh brown well ground and mixed ſomewhat thin, and, with a large briſtle bruſh dipped in it, colour the board or plane all over, both on the back as well as foreſide, to preſerve it the better, ſo that you leave no part uncoloured; this is called the priming of the Dial.

When this firſt colour is dry, do it over again with more of the ſame colour, tempered ſomewhat thicker; and, when this is alſo dry, you may, if you pleaſe, do it over again with the ſame colour; your work will be the ſubſtantialler and laſt longer.

When this laſt time of colouring with your priming is dry, then colour the face of the plane over with white lead, and, when is is dry, do it over again three or four times more ſucceſſively after each drying; and ſo will the face of your plane be ſufficiently defended again the fury and violence of the weather for many years.

When the laſt colouring of your white is dry, you muſt draw on your plane, with a black lead pencil, a horizontal line, as far diſtant from the uppermoſt edge of your Dial, as you ſhall think fit; then ſet out the margin of your Dial with boundary lines for the hour, half hour, and quarter diviſions of your Dial.

When this has been done, place the horizontal line of your paper draught on that which you before drew on the plane, placing the center according as the ſituation of the plane for conveniency ſake requires.

If your Dial be a full or direct ſouth Dial, then let the center be exactly in the middle of your plane; but, if your Dial decline from the ſouth either eaſt or weſt, then place not the center of the draught in the center of the plane, but nearer to one ſide or other of it, according as it declines, having alſo reſpect to the quantity of its declination.

For example, if your Dial decline eaſtward, then let the cen-

ter of your draught be placed between the center, and the eaſtern ſide of your plane; the quantity of which muſt be according to the declination of the Dial.

And, if it declines much, place the center of your draught the more out of the center of your plane.

This muſt be done in order to gain a greater diſtance for thoſe hour lines, which in declining planes fall nearer together on one ſide, than they are in another.

And for far decliners, as thoſe of ſeventy or eighty degrees, they are frequently drawn without centers.

Having placed the paper draught on the plane, faſten it on with pins or tacks; then let the draught thereof be transferred to the plane by laying a ruler over every hour, half hour, and quarter diviſions; and, where your ruler ſhall cut or interſect the boundary lines of your margin, there make marks by drawing lines with a black lead pencil of ſuch a length as each diviſion requires; obſerving to draw the hour and half hour lines quite through your margin, that they may be guides for the right placing of the figures; and for a ſmall ſpot that is uſually placed in the margin, right againſt the half hour

Having thus transferred your draught on the plane, you muſt draw the ſubſtilar line, according as it lies in the draught, to be a guide for the right placing the ſtile or cock.

The draught being thus transferred on the plane, draw the boundary lines of the Dial, as alſo the hour, half hour, and quarter diviſions with vermilion well ground in oil; make the colour as thick and ſtiff, as you can poſſibly work it, ſo as to draw a clear even line; becauſe this is to be done but once.

After you have drawn theſe lines with vermilion, make the figures with lamp-black, and a ſpot in the middle of the margin, right againſt the half hour line; and, if you pleaſe, you may, in the margin at the top of your plane, put the date of the year, your name, or ſome ſentence.

Then fit in your cock or ſtile, ſo as to make right angles with your plane, and then will your Dial be finiſhed.

To gild with gold on an oily ſize, either letters or figures in DIALS. Whatever you would gild muſt be firſt drawn with a gold ſize. (See the articles GOLD *Size*, and GILDING.) This you muſt let lie on, till it is ſufficiently dry to gild upon.

This is to be known by touching it with your finger, for, if your finger ſtick a little to it, and the gold ſize do not come off, then it is dry enough; but, if the colour come off on your finger, it is not dry enough, and then it muſt be let alone a little longer; for, if you ſhould then lay on your gold, it would ſo drown it, that it would give no gloſs; and, if the gold ſize be too dry, the leaf gold will not ſtick.

As for the manner of laying on the leaf gold, ſee the article GILDING.

After your gold is laid on, you may, if you pleaſe, diaper or flouriſh upon it with thin burnt umber, ſo thin that the gold may appear through it.

The way of painting a blue with ſmalt. Smalt, being a colour that gives its greateſt luſtre by ſtrewing, is to be performed as follows:

Firſt, temper up white lead pretty ſtiff with good clear drying oil; let it be as ſtiff as it well can be to ſpend well from the pencil, with this white colour; cover over the ſuperficies of the work, that is to be ſtrewed with ſmalt, and, if it be the margin of a Dial, whoſe figures are already gilt with gold, let every part between the figures, and where there is no gold laid on, be done over, and be very exact in the work, for the ſmalt takes no where but on this new and moiſt ground; then ſtrew the ſmalt thick on the part to be covered, and with the feather edge of a gooſe quill ſtroke it over, that it may lie even and alike thick on all places; and then, with a bunch of linen cloth that is ſoft and pliable, dab it down, that it may take well upon the ground; then ſtroke off the looſe colour with a feather, and blow off the remainder with a pair of bellows, and your work is finiſhed.

DIAMOND, a precious ſtone; the firſt in rank, value, hardneſs, and luſtre of all gems.

The goodneſs of Diamonds conſiſts in their water or colour, luſtre and weight; the moſt perfect colour is the white.

The defects of Diamonds are veins, flaws, ſpecks of red or black ſand, and a bluiſh or yellowiſh caſt.

Dr. Wall ſeems to have diſcovered an infallible method to diſtinguiſh Diamonds from other ſtones, which he gives as follows:

A Diamond with an eaſy, light friction in the dark, with any ſoft animal ſubſtance, as the finger, woollen, ſilk, &c. appears luminous in its whole body.

Nay, if you keep rubbing for ſome time, and then expoſe it to the eye, it will remain ſo for ſome time.

If, when the ſun is eighteen degrees below the horizon, you hold up a piece of baize or flannel, ſtretched tight between both hands, at ſome diſtance from the eye; and another rubbing the other ſide of the baize or flannel, pretty briſkly with a Diamond; the light is much more vivid and pleaſant than any other way.

But that which he judges the moſt ſurpriſing is, that a Diamond, being expoſed to the open air in view of the ſky, gives almoſt the ſame light of itſelf without rubbing, as if rubbed in a dark room; but if, in the open air, you put the hand or any thing a little over it, to prevent its immediate communication

with the ſky, it gives no light; which is a diſtinguiſhing criterion of a Diamond.

A rough DIAMOND, is one that is not yet cut, but juſt as it comes out of the mine.

A facet DIAMOND, is one that is cut in faces both at the top and on the bottom, and whoſe table or principal face at the top is flat.

A roſe DIAMOND, is one that is quite flat underneath, but its upper part cut in divers little faces, uſually triangles, the uppermoſt of which terminate in a point.

A table DIAMOND, is one which has a large ſquare face at top, encompaſſed with four leſſer.

Diamonds are only found in the Eaſt-Indies, and that only in the kingdom of Golconda, Viſapour, Bengal, and in the iſland Borneo.

There are four mines, or rather two mines and two rivers, from whence Diamonds are brought. The mines are,

1. That of Raolconda, in the province of Carnatica, five days journey from Golconda, and eight from Viſapour. This has been diſcovered about two hundred years and upwards.

2. That of Gani or Couleur, ſeven days journey from Golconda eaſtwardly. It was diſcovered between a hundred and twenty and a hundred and thirty years ſince by a peaſant, who, digging in the ground, found a natural fragment of twenty-five carats.

3. That of Soumelpour, a large town in the kingdom of Bengal, near the Diamond mine: This is the moſt ancient of them all. It ſhould rather be called that of Goual, which is the name of the river, in the ſand of which the ſtones are found.

4. The laſt mine, or rather the ſecond river, is that of Succudan, in the iſland of Borneo.

The DIAMOND *mine of Raolconda.* In the neighbourhood of this mine, the earth is ſandy, and full of rocks and copſe.

In theſe rocks are found ſeveral little veins of half, and ſometimes a whole inch broad, out of which the miners, with a kind of hooked irons, draw the ſand or earth, in which the Diamonds are, breaking the rocks, when the vein terminates, that the track may be found again and continued.

When a ſufficient quantity of earth or ſand is drawn forth, they waſh it two or three times, to ſeparate the ſtones from it.

The miners work quite naked, except a thin linen cloth before them; and, beſides this precaution, have alſo inſpectors to prevent their concealing of ſtones; which, however, notwithſtanding all this care, they frequently find means to do, by watching opportunities when they are not obſerved, and ſwallowing them down.

The

The DIAMOND *mine of Gani or Couleur.* In this mine are found a great number of ſtones, from ten to forty carats, and even more; and it was here that famous Diamond of Aureng-Zeb, the Great Mogul, was found; which, before it was cut, weighed 780 carats.

The ſtones of this mine are not very clear, and their water is uſually tinged with the quality of the ſoil, it being black, where that is marſhy; red, where it partakes of red; and ſometimes green and yellow, if the ground happen to be of thoſe colours.

Another defect of ſome conſequence is a kind of fat appearing upon the Diamond, when cut, which takes off part of its luſtre.

There are commonly not leſs than 60,000 perſons, men, women, and children, at work in this mine.

When the miners have found a place, where they intend to dig, they level another ſomewhat bigger not far from it, and incloſe it with walls about two feet high, only leaving apertures from ſpace to ſpace, to give paſſage to the water.

After the performing a few ſuperſtitious ceremonies, and a kind of feaſt, which the maſter of the mine entertains the workmen with, to encourage them; they betake themſelves to their buſineſs, the men digging the earth in the place firſt diſcovered, and the women and children carrying it off into the wall round.

They dig twelve or fourteen feet deep, and till ſuch time as they find water.

Then they ceaſe digging, and the water, thus found, ſerves to waſh the earth two or three times, after which it is let out at the openings left for that purpoſe.

This earth being well waſhed and well dried, they ſift it in a kind of open ſieve, or riddle; then they threſh it and ſift it again, ſearching it well with their hands to find the Diamonds. They work naked, as in the mine of Raolconda, and are watched in like manner by inſpectors.

The DIAMOND *mine of Soumelpour, or river of Goual.*

Soumelpour is a large town, built all of earth, and covered with branches of cocoa-trees; the river of Goual running by the foot of it, in its paſſing from the high mountain towards the ſouth to the Ganges, where it loſes its name.

It is from this river are brought all our fine Diamond points or ſparks called natural ſparks.

They never begin to ſeek for Diamonds in this river, till after the great rains are over, that is, after the month of December; and they uſually even wait till the water is grown clear, which is not before January.

When the ſeaſon is come, eight or ten thouſand perſons of all ages and ſexes come out of Soumelpour, and the neighbouring villages.

The moſt experienced among them ſearch and examine the ſand of the river, going up it from Soumelpour to the very mountains whence it ſprings.

A great ſign, that there are Diamonds in it, is the finding thoſe ſtones, which we Europeans call thunder-ſtones.

When all the ſand of the river, which at that time is very low, has been well examined, they proceed to take up that wherein they judge Diamonds likely to be found, which is done after the following manner: They dam the place round with ſtones, earth, and faſcines, and, lading out the water, dig about two feet deep; the ſand, thus got, is carried into a place walled round, on the bank of the river.

The reſt is performed after the manner as at Couleur, and the workmen watched with equal ſtrictneſs.

The DIAMOND *mine in the iſland of Borneo, or river of Succudan.*

We are but little acquainted with this mine; the Queen, who reigns in that part of the iſland, not allowing ſtrangers to have any commerce in theſe ſtones; though there are very fine ones to be bought at Batavia, which are brought thither by ſtealth.

They were anciently imagined to be ſofter than thoſe of the other mines; but experience ſhews, that they are in no reſpect inferior to them.

Beſides theſe four Diamond mines, there have been two other diſcovered, one of them between Couleur and Raolconda, and the other in the province of Carnatica; but they were both cloſed up, almoſt as ſoon as diſcovered: That of Carnatica, by reaſon that the water of the Diamonds was either black or yellow; and the other on account of their cracking and flying in pieces, when cut and ground.

The Diamond, as has been obſerved, is the hardeſt of all precious ſtones; it can only be cut and ground by itſelf, and its own ſubſtance.

To bring it to that perfection, which augments its price ſo conſiderably, they begin by rubbing ſeveral againſt each other, while rough; after having well glued them to the ends of two ſticks or blocks, thick enough to be held in the hand. It is this powder, thus rubbed off the ſtones, and received in a little box for that purpoſe, that ſerves to grind and poliſh the ſtones.

Diamonds are cut and poliſhed by means of a mill, which turns a wheel of ſoft iron, ſprinkled over with Diamond duſt, mixed with oil of olives.

The ſame duſt, well ground and diluted with water and vinegar, is uſed in the ſawing of Diamonds; which is performed with an iron or braſs wire as fine as a hair.

Sometimes, inſtead of ſawing the Diamonds, they cleave them, eſpecially if there be any large ſhivers in them; but the Euro-

peans are not daring enough to run the riſque of cleaving, for fear of breaking them.

A rough Diamond ought to be choſen uniform, of a good ſhape, tranſparent, not quite white, and free from flaws and ſhivers.

Black, rugged, dirty, flawy, veiny ſtones, and all ſuch as are not fit for cutting, are pounded in a ſteel mortar made for that purpoſe; and, when they are reduced to a powder they ſerve for ſawing, cutting, and poliſhing the reſt.

Shivers are cauſed in Diamonds by this, that the miners, to get them more eaſily out of the vein, which winds between two rocks, break the rocks with huge iron levers, which ſhakes and fills the ſtone with ſhivers.

The ancients had two miſtaken notions as to the Diamond; the firſt is, that it becomes ſoft, by ſteeping it in hot goats blood; and the ſecond is, that it is malleable, and bears the hammer. Experience has ſhewn the contrary, there being nothing capable of mollifying the hardneſs of this ſtone; though its hardneſs be not ſuch, that it will endure being ſtruck at pleaſure with the hammer.

The fineſt Diamonds now in the world are that of the Great Mogul, weighing 279 carats; that of the Great Duke of Tuſcany, weighing 139 carats; and that known in France by the name of grand ſancy, which is one of the crown jewels, weighing 106 carats; whence comes its name ſancy, which is a corruption of cent ſix, i. e. 106.

Tavernier, by a rule which he had made for eſtimating the value of Diamonds, computes that the Great Mogul's is worth 110,000,073,238 French livres, equivalent to 879244 pounds ſterling; and that of the Duke of Tuſcany, 2,618,335 livres, or 195,374 pounds ſterling.

The following is a rate, or manner of eſtimating the value of Diamonds, drawn up by a perſon exceedingly well verſed in thoſe matters; and which, for its curioſity as well as the uſe it may be of, to perſons who deal in precious ſtones, we judge will be highly acceptable.

DIAMONDS, *cut facet or table-wiſe. Dutch cut.*

	l. s.	l. s. ſterl.
A Diamond weighing 1 grain is worth	1 00 to	1 1
1½	1 16 to	1 17
2	2 15 to	3 00
2¼	3 12 to	3 15
3	4 15 to	5 00
4	7 17 to	8 00

		l. s.		l. s. sterl.
A Diamond weighing 5 grains is worth		15 00	to	15 15
6		22 00	to	25 00
7		30 00	to	34 00
8		42 00	to	45 00
9		60 00		
10		75 00		
12		112 00	to	120 00
15		187 00	to	220 00
19		330 00	to	380 00
24		450 00		
30		700 00	to	735 00
40		1500 00	to	1800 00
50		3500 00	to	4500 00
60		4500 00	to	5620 00

Antwerp cut.

		l. s.		l. s. sterl.
A Diamond weighing 1 grain is worth from		00 15	to	00 18
1½		1 6	to	1 10
2		2 2	to	2 5
3		3 12	to	3 15
4		6 00	to	6 7
5		10 10	to	11 5
6		13 10	to	15 00
7		18 15	to	22 10
8		24 00	to	26 00
9		33 15		
10		37 00	to	40 00
12		55 00	to	58 00
15		112 00	to	130 00
18		247 00		
24		315 00		
40		900 00	to	970 00
50		2200 00	to	2300 00
60		3500 00	to	4500 00

Mr. Jeffrys lays down the following rule for the valuation of Diamonds of all weights; he firſt ſuppoſes the value of a rough Diamond to be ſettled at 2 l. per carat, at a medium; then, to find the value of Diamonds of greater weights, multiply the ſquare of their weight by 2, and the product is the value required; as, for example, to find the value of a rough Diamond of 2 carats $2 \times 2 = 4$, the ſquare of the weight, which, multiplied

plied by 2, gives 8 l. the true value of a rough Diamond of 2 carats. For, finding the value of manufactured Diamonds, he ſuppoſes half their weight to be loſt in the manufacturing them; and, therefore, to find their value, we muſt multiply the ſquare of double their weight by 2, which will give us their true value in pounds; thus, to find the value of a wrought Diamond weighing 2 carats, we firſt find the ſquare of double the weight, viz. $4 \times 4 = 16$, then $16 \times 2 = 32$; ſo that the true value of a manufactured Diamond of two carats is 32 l.

By this means Mr. Jeffrys has conſtructed tables of the price of Diamonds, from 1 to 100 carats. See Jeffrys on Diamonds, p. 8, 9, 11, & ſeq. of his tables.

Rough Diamonds are more commonly found of a 6 pointed figure than of any other, and theſe are called 6 pointed rough Diamonds, the figure of which is compoſed of 2 ſquare pyramids joined at their baſis; hence the whole figure is compoſed of 8 triangular faces or planes, 4 of which meet in a point above the baſe, and 4 below it in another point.

The diſtance of theſe two points is the axis of the figure.

It muſt be obſerved however, that defects in the water or ſhape, red or black ſpots, ſhivers, and other failings, frequently found in theſe ſtones, reduce the price by one third, and ſometimes more.

As to brilliant or roſe Diamonds, the price is always leſs by one third, than table Diamonds, though the weight be the ſame; the reaſon is, that the latter ſhew themſelves a great deal more when ſet in their collets, than the former.

The factitious Diamonds made in France, called temple Diamonds, becauſe the beſt of them are made in the temple at Paris, are vaſtly ſhort of the genuine ones; and accordingly are but little valued, though the conſumption thereof is pretty conſiderable for the habits of the actors on the ſtage.

DIAMONDS, *the way of making artificial ones.*

To counterfeit DIAMONDS, *ſo as to endure the fire and harden them.* Take of good natural cryſtal, calcined and reduced to ſubtile powder, what quantity you pleaſe; fill a pot with it, and ſet it in a glaſs-houſe furnace for twelve hours, to be melted and purified; then drop the melted matter into cold water, then dry it, and reduce it again to powder; add to that powder its weight of fine ſalt of tartar.

Mix theſe two powders well, and make little pills of them with common water.

Then wipe theſe pills, and put them into an earthen pot on a ſtrong fire, there to grow red-hot for twelve hours without melting.

Then put them into a pot in a glaſs-houſe furnace, where let

them ſtand two days, to be well melted and purified; then ſet the matter for twelve hours in the annealing furnace to cool gradually.

Afterwards break the crucible, and you will have a fine material for Diamonds, which muſt be cut and poliſhed at the wheel.

How to make a DIAMOND *out of a ſapphire, according to Porta's deſcription.* The ſureſt way we uſed to make the Diamond was in the following manner: We filled an earthen pipkin or crucible with quick-lime, and laid the ſapphire in the midſt thereof, covering it firſt with a tile, and then with coals, all over, blowing them gently till we had a clear fire: For, if it is blown too much, it may occaſion the breaking of the ſtone.

When we thought that the ſapphire had changed its colour, we let the fire go out of itſelf, and took it out to ſee whether it was turnip-white; if ſo, then we laid it again in the crucible, in order to let it cool with the fire; but, if it had not the right colour, then we augmented the heat again as before, and looked often to ſee whether the force of the fire had taken away all the colour, which was done in about five or ſix hours: If then the blue colour was not quite gone, we began our operation afreſh, till it was white and clear. It is to be obſerved, that the heat of the fire in the beginning of your operation muſt increaſe by ſlow degrees, and alſo in the ſame manner decreaſe: For, if the ſtones comes either too ſuddenly into the heat, or from the heat into the cold, it is apt to turn dark, or fly to pieces.

In like manner all other precious ſtones loſe their colour, ſome ſooner than others, according as they are either harder or ſofter. The amethyſt is very light, and requires but a ſlow fire; for, if it has too much heat, it becomes dark, or turns into chalk.

This is the art whereby inferior precious ſtones are changed into Diamonds: They are afterwards cut in the middle, and a colour given them: And from hence comes the ſecond ſort of falſe Diamonds or doublets.

Bartholomew Korndorffer's ſecret to make a DIAMOND *of natural cryſtal.* Take the beſt poliſhed cryſtal, no matter whether large or ſmall, ſo it is but clear and tranſparent; put it into a crucible, with three times as much of my fixed ſulphur of gold, ſo that the cryſtal may be covered all over with it. Then, after you have put a lid over it and luted the crucible well, let it, for three days and nights, neal in a ſtrong fire; then take it out and quench it in ſpring water, in which red-hot ſteel has been quenched forty-ſix times running; and you will have a Diamond which reſembles a natural one in every reſpect, and is right and good.

Thus far Korndorffer, but, as to his ſulphur, he has left us in the dark.

DIAMONDS, are repreſented, in miniature, by laying them quite black, and heightening with gentle touches of white on the light ſide.

DIANA, who was alſo called Cynthia, Lucina, and Luna, was, according to Propertius, repreſented, in painting, &c. in the likeneſs of a young beautiful virgin; having on each ſide of her forehead two glittering horns, newly putting forth; drawn through the air in a purple-coloured coach, by two ſwift-paced horſes; the one of a ſad colour, and the other a white.

Cicero deſcribes the ſtatue of Diana, which he brought out of a temple in Cilicia, of a wonderful height and large dimenſion, the whole body covered with a large thin veil, of a youthful aſpect, holding in her right-hand a lively burning torch, and in her left an ivory bow, with a quiver of ſilver-headed arrows hanging at her back.

The poets, who call her the goddeſs of hunting, and the imperial governeſs of woods and groves, deſcribe her in the habit of a young nymph, with her bow ready bent in her hand; a quiver of arrows hanging by her left ſide; a ſwift-paced greyhound faſt tied to her right-ſide, with a collar about his neck, and troops of Sylvan virgins following her, which are chaſte, and called the nymphs of Diana.

The Egyptians are ſuppoſed to have worſhipped her under the name of Iſis, and repreſented her, in painting, covered with a black and ſable veſtment, in token that ſhe herſelf give no light; holding in one hand a cymbal, and in the other an earthen veſſel of water; upon which, as Servius ſays, many thought her to be the genius of Egypt.

By the cymbal is intimated the murmurings and roarings of Nilus, when it overflows Egypt; and by the earthen veſſel the nature of the country, which is moiſt and full of lakes, pools, and rivers.

She is alſo painted with yellow hair, a graſs-green mantle trimmed with ſilver, ſilver buſkins, golden bow and quiver of various colours.

The nymphæ Dianæ are depicted in white linen, to denote their virginity; and their garments girt about them, their arms and ſhoulders naked; bows in their hands, and arrows by their ſides.

DIDO, queen of Carthage, is depicted in a purple or ſcarlet mantle, and her upper garments purple, with yellow hair, tied up with ſpangles and knots of gold, holding in her hand a golden quiver.

Abraham DIEPENBEC, a ſcholar of Peter Paul Rubens, excelled in hiſtory.

Lord DIGBY, biſhop of Elfin in Ireland, may very well find a name

a name in the account of Engliſh painters. His limnings have much of beauty and boldneſs of draught in them, and are to a great degree elaborate with a due regard to a graceful part of nature; he is a ſingle inſtance of any perſon of that robe, that has made ſo conſiderable a progreſs in this art, as to be voted a maſter either in that kingdom or this, how common ſoever it is in other nations for the clergy to apply themſelves to painting.

DIGNITY, is repreſented, in painting, &c. by a woman richly adorned, but ſinking under the burthen of a huge ſtone, inchaced within a border of gold and precious ſtones; her load expreſſes Dignity, becauſe that, proceeding from the care of public affairs, is, a very heavy burthen, and hard to be ſupported.

Adrian Van DIEST, was a famous landſcape-painter, born at the Hague, but whom we may very well term an Engliſh painter, being brought up here from his youth; he was chiefly inſtructed by his father, who commonly drew ſea-pieces; but that which contributed moſt to make the ſon a maſter, as he often owned, was drawing after thoſe noble views of England, in the weſtern parts and along our coaſts. He alſo drew many of the ruined caſtles in Devonſhire and Cornwall, being encouraged by that noble peer the earl of Bath, at his ſeat in thoſe parts. This painter's diſtances have a peculiar tenderneſs, and his clouds a freedom that few have arrived at.

DILIGENCE, is repreſented, in painting, &c. by a woman of a lively aſpect, with a ſprig of thyme in one hand, and a bee buzzing about it; in the other a bundle of almond and mulberry leaves, and a cock at her feet ſcraping.—The bee repreſents Diligence, by ſucking a pleaſant juice out of a dry herb; the almond and mulberry leaves, the middle way between haſtineſs and ſlowneſs in buſineſs; the firſt flouriſhing very early, and the other very late; the cock, by his ſcraping, denotes that he, riſing betimes, can diſcern a barley-corn from dung.

DIOPTRICS, is properly the third branch of optics; its office being to conſider and explain the effects of light refracted, by paſſing through different mediums, as air, water, glaſs, &c. and eſpecially lens's.

DIRECT *Viſion*, in optics, ſignifies that performed by direct rays, in contradiſtinction to viſion by refracted or reflected rays.

DIRECT *Rays*, are thoſe which paſs in right lines from the luminary to the eye, without being turned out of their rectilinear direction by any intermediate body, either opaque or pellucid.

DISCRETION, is repreſented, in painting, &c. by an aged woman of a grave countenance, inclining her head to the left, lifting up her arm as a token of pity; with a plummet in one hand, and a camel by her ſide.—The plummet denotes Diſcretion, by adapting itſelf to human imperfections, and never de-

viates from itſelf, always juſt and perfect; the camel, prudence, never carrying a burthen above its ſtrength.

DISPERSION, as point of Diſperſion in dioptrics, is a point from which refracted rays begin to diverge, when their refraction renders them divergent.—It is called the point of Diſperſion in oppoſition to the point of concourſe, which is the point wherein converging rays concur after refraction.

DISSIMULATION, is repreſented, in painting, &c. as a lady wearing a vizard of two faces, in a long robe of a changeable colour, and in her right-hand a magpie.

Line of DISTANCE, in perſpective, is a right-line drawn from the eye to the principal point.

Point of DISTANCE, in perſpective, is a point in the horizontal line at ſuch a Diſtance from the principal point, as is that of the eye from the ſame.

DISTEMPER, in painting, is a term uſed for the working up of colours with ſomething elſe beſides water or oil; as ſize, whites of eggs, or any ſuch proper glutinous or unctuous ſubſtance. Pieces painted with ſuch colours are ſaid to be done in Diſtemper, as the admirable cartoons at Hampton-Court are.

All colours are proper in this ſort of work, except the white of lime, which is never uſed but in freſco.

Azure and ultramarine muſt be uſed with a paſte made of glove-ſkin or parchment, for the yolks of eggs will make the blue colours turn green; which they do not with paſte or gum, either on walls or boards.

If the work is on walls, care muſt be taken that they be dry: The painter muſt even lay on two layers of paſte quite hot, before he applies the colours, which, if he pleaſes, he may alſo temper with paſte, or compoſition of yolks of eggs and fig-tree branches. But it is certain, that the colours with paſte keep better.

And thus have all the deſigns or cartoons for tapeſtry been painted on paper. This paſte, as has been ſaid, is made of glove-ſkin or parchment.

When a painter would work upon cloth, he muſt chuſe that which is old, half uſed, and very ſmooth; then preſs pounded plaiſter with glove-ſkin paſte over it.

All the colours are ground with water, each by itſelf; and as the painter wants them for his work, he tempers them with paſte-water.

If he would varniſh the picture when it is finiſhed, he need only rub it with the white of an egg well beaten, and then put one layer of varniſh over it; for the greateſt diſadvantage of Diſtemper is, that it has no glittering, and all its colours look dead; by which means they appear alike in all ſorts of lights,

which

which oil colours or colours in Diſtemper, when varniſhed, do not.

DIVERGENT } *Lines*, in geometry, are ſuch whoſe diſtance
DIVERGING } is continually increaſing. — Lines which converge one way, diverge the oppoſite way.

DIVERGENT, } in optics, is particularly applied to rays, which
DIVERGING, } iſſuing from a radiant point, or having in their paſſage undergone a refraction or reflection, do continually recede further from each other.

In which ſenſe the word ſtands in oppoſition to convergent, which ſignifies that the rays approach each other, or that they tend to a center, where being arrived, they interſect, and, if continued further, become Diverging.

Concave glaſſes render the rays Diverging, and convex ones converging.—Concave mirrors make the rays converge, and convex ones diverge.

DIVINITY, is repreſented, in painting, &c. by a lady all in white, with a flame on the crown of her head, and a blue globe alſo flaming in each hand.—The white ſignifies the purity of the Trinity; the object of the ſtudy of a divine is expreſſed by the three flames; the globes denote eternity by the round figure inſeparable from the divine eſſence.

D. M. C. ſignifies Dominico Maria Canuti, a copious painter of Bologna.

DO. *Cap.* 1518. ſtands for Dominico Campagnola of Venice.

Mr. William DOBSON, born in the year 1610, imitated Van Dyke, lived at London and Oxford, excelled in portraits, died in the year 1647, aged thirty-ſeven years.

DOMINION, is repreſented, in painting, &c. by a man in a noble ſumptuous habit, his head ſurrounded with a ſerpent, a ſcepter in his left-hand with an eye upon it; his arm extended, and pointing with his fore-finger, as is uſual with thoſe who have Dominion.—The ſerpent was a ſign of Dominion amongſt the Romans, as is confirmed by the example of Severus and young Maximinian; both whoſe heads being ſurrounded with ſerpents, without offering them any harm, was a token of future grandeur; as for the eye, it ſignifieth the vigilance a great prince ought to have, who has an abſolute command over a people.

DOMINION *over one's ſelf*, is repreſented, in painting, &c. by a woman ſitting upon a lion, guiding the bridle, which he holds in his mouth with one hand, with the other pricks him.—The lion denotes the mind and its ſtrength, that reaſon ſhould curb the ſpirit if too briſk, and ſpur and prick it if too drouſy and dull; ſo that reaſon is a ray ſent from heaven to govern us in all our actions.

DRAGONS *blood*, *ſanguis draconis*, a moderately heavy dry reſin

reſin of a friable texture, of a duſky red colour on the ſurface, and indeed throughout while whole, but, when powdered, it becomes an extremely bright and glowing ſcarlet colour; it eaſily melts over the fire, and is inflammable, diffuſing a very ſingular and not diſagreeable ſmell; when broke and held up againſt a ſtrong light, it is ſomewhat tranſparent. It has very little ſmell, and is of an auſtere reſinous and aſtringent taſte.

We have two kinds of Sanguis draconis in the ſhops; the one ſort is very firm and compact, and is brought to us in lumps ſomewhat more than an inch long, and about half an inch in diameter. Theſe are wrapped up in long narrow leaves of a yellowiſh-green colour, and are called drops or tears of Dragons blood, which is preferable to any other kind; the other is brought to us in larger cakes of an irregular flattiſh figure; this is leſs compact and leſs pure than the former, much more friable and leſs reſinous; it powders more eaſily, but the powder is not of ſo bright and fine a colour. This is called common Dragons blood, and is greatly inferior to the former in value.

Beſides theſe two we ſometimes meet with a third, which is ſoft; it is viſcous and of a fine deep blood colour. It has the ſmell and taſte of the finer dry kind, and, by keeping, it grows hard and wholly like it. Theſe three are all genuine, but we are careful to avoid a counterfeit ſort made of ſeveral reſinous matters melted into a maſs, and coloured with the true Dragons blood, or braſil wood; this is of no value.

DRAPERY, in painting and ſculpture, ſignifies the repreſentation of the garments or cloathing of human figures; it alſo includes, not only the garments, but alſo hangings, tapeſtry, curtains, and moſt other things that are not carnations or landſcapes.

The art of Drapery conſiſts chiefly in three points, viz. the order of the folds or plaits, the different quality of the ſtuffs, and the variety of their colours.

1. As to the folds, they ought to be ſo managed, that you may eaſily perceive what it is that they cover, and diſtinguiſh it from any thing elſe; as, for inſtance, that you ſee it is an arm that is under the Drapery, and not a leg; or a leg, and not an arm, &c.

Again, the folds ought to be large, as breaking and dividing the ſight the leſs. There likewiſe ſhould be a contraſt between them, otherwiſe the Drapery will be ſtiff.

2. The quality of the ſtuffs ſhould likewiſe be well conſidered; ſome cauſing their folds to be abrupt and harſh, and others more ſoft and eaſy.

3. Again, the ſurface of ſome have a luſtre, and others are flat and dead; ſome are fine and tranſparent, others firm and ſolid.

4. The variety of colours, when well managed, makes the greateſt

greateſt beauty of painting; all not being equally amicable and friendly, with reſpect to each other; and ſome never to be placed near certain others. See COLOURING.

Mr. de Piles gives abundance of good obſervations as to Drapery.

He obſerves, that their firſt effect, and that which the painter ought to have principally in view, is, that they expreſs the thing they are ſuppoſed to cover.

2. That they muſt never be made to adhere and ſtick to the parts of the body.

3. That a great lightneſs and motion of the Drapery are only proper in figures in great agitation, or expoſed to the wind.

4. That the nudities of the figures ſhould always be deſigned before the painter proceeds to the Draperies.

1. Draw the outlines of garments lightly, and be very careful in it, for the whole grace of the picture lies in it; then draw the great folds firſt, and ſtroke thoſe into leſſer, and be ſure that they croſs not one another.

2. Suit the garments to the body, and make them bend with the body, according as it ſtands in or out, ſtraight or crooked, or turns one way or another; the cloſer the garment ſits to the body, the narrower and ſmaller muſt the folds be.

3. All the folds muſt conſiſt of two lines and no more, which you may turn with the garment at pleaſure, ſhadowing the inner deeper, the outermoſt more light; and, if the folds be never ſo curiouſly contrived, ſpare not to ſhadow them (if they fall inward from the light) with a double or triple ſhadow, as the occaſion requires.

4. The outlines muſt be continued through the whole garment, the leſſer you may break off and ſhorten, as you pleaſe.

5. The ſhades in ſilk and fine linen are very thick and ſmall, which require little folds, and a light and rare ſhadow, commonly but double the moſt; and ſo alſo fine Drapery requires more and ſharper folds than coarſe.

6. That part of a garment that ſits cloſe to a body muſt not be folded at all, but only ſweetly ſhaded to repreſent the part of the body that lies under it.

7. Obſerve the motion of the wind and air for drawing looſe apparel all one way, drawing that part of the garment firſt, which lies higheſt and cloſeſt upon the body, before you draw the looſer part that flies off from the body, leſt, by drawing the looſe part of the garment firſt, you ſhould be out, and ſo place the body crooked or awry.

8. You ought alſo to examine the nature and diſpoſition of light, eſpecially as it has relation to the ſun or any bright body; for

for that colours cannot be seen but in the light, and by the help thereof they appear with a grace.

9. Suppose blue be equally dispersed through all the parts of a garment, so that there is no more in one part than another; yet, notwithstanding, when it is illustrated by any light, it causeth one kind of brightness in that part where it strikes strongly, and another kind of lustre where it strikes more weakly, and another in that part where it yet shines less.

10. Now, to imitate this blue, you must take your artificial blue colour, and temper it one way to express the natural blue of the garment; but another way to express it in the light, viz. you must mix so much white with your blue as you find light in that part of the garment, where the light strikes; more (or less) white, where it strikes with less; and still in proportion, less and less, till you come to the parts where the light shines not.

11. Where the light shines not but by reflection, there you must only mix so much shadow with the blue, as shall be enough to express that counterfeit light, losing itself as it were by degrees; always taking care to make the lights and shadows to answer.

12. The folds or plaits ought to run out every way like branches or arms from the body of a tree; and to be so made, that one plait may so rise from another, as one branch or bough or one stream of water comes out from another, in such sort that there be no part of the garment, wherein there appear not some of these folds.

13. Now these motions ought to be moderate, gentle, and free, without any interruption, more to be admired for their grace and facility, than for affected pains and industry; and because all sorts of cloths have their several motions, as well as bodies; it must needs be, that they differ between themselves, according to the things wherein they disagree.

14. For this cause, there must be more light in fine cloth, as sarcenet, linen, cambric, cypress, &c. in which the plaits are small, raised up, trembling, and, as it were, sweetly waving; somewhat puffed up; by extending and spreading themselves like a snail, where the motion receiveth more strength by the wind, they fall close upon the bare skin, as is to be seen in womens garments; upon which, by reason of their thinness, they fall close upon the parts, on that side where the wind blows, but are blown up on the contrary side; the same happens in mantles, the loose ends of girdles and garters. All which motions more fitly appertain unto the apparel of nymphs, goddesses, &c. by reason of their lightness and airiness.

15. Gross and dull shadows are found in stiff cloths, where the plaits are few and gross, so that they are capable but of slow motion,

motion, and therefore they ſink downwards, and can ſcarcely fall cloſe to the bare ſkin, for that their own groſſneſs ſuſtains them; and theſe motions do moſtly appear in cloth of gold, thick leather, coarſe woollen cloth, &c. upon which the air can have little or no force.

16. Moreover, the plaits or folds muſt have their motions accordingly as they are managed by the wearer, as under the arm and under the knee, by opening and ſtretching out the arm and leg; always making hard, ſtiff, and groſs folds, without weakneſs or pliableneſs, in ſuch ſort, that, by their appearance, the nature and quality of the garment may be known.

17. But mean motions, which are neither too groſs nor too ſlight, are ſuch as appear in the folds of ſtuff and other cloths of fine wool; and theſe may eaſily enough be moved by the air, or become pliable to a perſons limbs; and ſo make not only ſweet and pleaſant folds, but may follow the bare fleſh very well, becoming moveable and nimble, and falling pliably about the loins or any other part.

But, beſides theſe, there are alſo other kinds of mixed motions, called turnings or croſſings, which are proper unto damaſks, cloths of gold, ſattins, taffaties, &c.

In which, folds, croſſing and breaking one another, appear from the various natures, qualities, and conditions of the Drapery; but theſe things are ſo to be performed as not to favour of an over-affected imitation, without grace or order, to the ſcandal of the artiſt and his deſigns. See plate VI.

DRAPERIES. To make blue Draperies in miniature, put ultramarine near the white on your pallet, and mix them in ſuch proportions, as to produce a very pale colour and of a good body. With this you may expreſs your brighteſt lights and afterwards add more ultramarine for ſuch as are darker, and ſo continue to do to the deepeſt fold and darkeſt ſhades, which muſt be pure ultramarine; and all this muſt be done with broad ſtrokes of the pencil, with a due regard had to the ſcumbling of the different degrees of light and ſhade, loſing the lights into the ſhades, with a colour not ſo pale as the lights, or deep as the ſhades. Then ſtipple the whole with the ſame colours and the ſame degrees, but ſomewhat ſtrongly, that the points may be ſeen; the whole muſt flow imperceptibly together, that the folds may not appear cut, and no line of ſeparation be ſeen. When, for the deepeſt ſhades the ultramarine happens not to be dark enough, how much ſoever it may be gummed, you mix indigo with it to give them the laſt degree of depth; and, if the lights are not ſtrong enough, you may heighten them with white and a very little ultramarine.

A carmine Drapery is done after the ſame manner with the blue,

Facing P. 224.

Plate. VI.





blue, except that in the darkeſt places you lay on vermilion before you uſe the carmine, which is applied with out any white, and in the deepeſt ſhades it muſt be well gummed. To deepen it the more, add a little biſtre.

There is another Drapery all of vermilion, with a mixture of white for the lights, laying it on ſingle upon the darkeſt parts, and adding carmine for the deepeſt ſhades. You finiſh then with the ſame colours, as in other Draperies; and, if the carmine and vermilion together are not ſtrong enough, take carmine alone, but only for the deepeſt ſhades.

A Drapery of lake is done like that of carmine, mixing a good deal of white therewith for the lights, and but very little for the ſhades: You are to finiſh with ſtippling, but we uſe no vermilion.

Purple Draperies are made by the ſame rule, having firſt prepared a mixture of carmine and ultramarine, and continually uſing white for the lights. If you would have it a columbine or light purple, your carmine muſt be in greater quantity than the ultramarine; but, if you would have it be more blue and deep, let there be more ultramarine.

For a fleſh colour drapery, begin with laying on a very pale mixture of white, vermilion, and lake; and ſhade with the ſame colours, diminiſhing the quantity of the white.

This Drapery muſt be very pale and delicate, becauſe it muſt repreſent a ſlight ſtuff, and even the ſhades muſt not be dark.

For a yellow Drapery, lay on all over, firſt maſticote, and then over that gamboge, excepting only the lighteſt parts, where you muſt leave the maſticote pure. Then ſhade with oker, mingled with a little gamboge and maſticote, increaſing and decreaſing the quantity of this laſt, according to the ſtrength of the ſhades; and, when you want them to be ſtill darker, add gall-ſtone. You may work with gall-ſtone alone for the deeper ſhades, adding thereto biſtre, if it be not dark enough; finiſh with the ſame colours you began with, ſtippling and blending the lights with the ſhades.

For another ſort of yellow, uſe Naples yellow or French pink, inſtead of maſticote or gamboge.

Green Drapery is produced by colouring all over, with verditer, with which, if it prove too blue for you, you may mix maſticote for the lights, and gamboge for the ſhades. Then add a proportion of ſad green to ſhade with; and, as your ſhades grow very deep, you muſt add the darker greens, and even uſe them unmixed, where you want to be extremely dark. Finiſh with the ſame colours, a little darker than at firſt.

For a black Drapery, you muſt lay on black and white, and finiſh with the ſame, increaſing the black as you want it for the

ſhades; for the deepeſt of which add ſome indigo, eſpecially if you would give your Drapery the look of velvet. You may in all caſes touch up your lights with a brighter colour.

For a Drapery of white woollen cloth, lay on a mixture of white, a very little oker, orpiment, or gall-ſtone, to give it a yellowiſh caſt; then ſhade and finiſh with blue, a little black, white, and biſtre mixed together, adding this laſt for the browneſt ſhades.

A light grey is laid on with black and white, and finiſhed with the ſame, made a little darker.

For a minim, dark, brown, tawny, or dun Drapery, lay on biſtre with white, a little brown-red, and ſhade with the ſame mixture, but let it be a little darker

There are other ſorts of Draperies, called changeable, becauſe the lights are of one colour and the ſhades of another; theſe are uſed for the cloathing of angels, and for other young and gay figures, as alſo for ſcarves, and other light parts of dreſs, which fall into a number of folds and flow to the wind. Theſe are moſt commonly purple, and of theſe there are two ſorts, the one with blue lights, and the other with yellow.

For the former, lay on ultramarine and white very pale for the lights, and ſhade with carmine, ultramarine, and white, the ſame as for a purple Drapery; ſo that only the very brighteſt lights appear blue; and even then you muſt ſtipple with purple, with a large quantity of white, and ſcumble the whole artfully together.

For the latter, uſe maſticote for your lights inſtead of blue; then proceed as for a Drapery of pure purple, except that you muſt ſtipple and blend lights with the ſhades; that is, the yellow with the purple, by the help of a little gamboge.

Carmine red is ordered like this laſt, that is, the lights muſt be maſticote, and the ſhades carmine; and, to ſcumble them, you muſt uſe gamboge.

Lake red, like carmine.

Green muſt be ordered in the ſame manner as lake, continually mixing verditer with the ſadder greens, for the middling ſhades.

Many other ſorts of theſe may be contrived at pleaſure, keeping to the union of the colours, not only in one figure, but alſo in a groupe of ſeveral figures, avoiding, as much as the ſubject will permit, to put blue next to a flame colour, or contraſting green with black; and ſo of others that diſagree or afford no proper union.

Other Draperies may be made of ſad, dirty, and brown mixtures and ſimples, and all by the directions already given; others alſo may be contrived, both of broken and complicated colours, but a harmony between them muſt be preſerved, that they do

not

not offend the eye. There is no laying down a rule to guide you in this; you muſt by practice and experience make yourſelf acquainted with the power and effect of your colours, and work accordingly.

Linens are painted thus: Having drawn your folds, as when you do Drapery, lay on white all over, and then proceed and finiſh with a mixture of ultramarine, black, and white, taking more or leſs of this laſt, according to the degrees you want of light and ſhade; and, for the deepeſt folds, take biſtre and a little white, uſing it ſparingly and with artful touches; and you may even take the former alone for the deepeſt ſhades, where you muſt expreſs the folds, and loſe them into the reſt.

They may be made after a different manner, by laying on, all over, a very pale mixture of ultramarine, black, and white, and then proceed in the manner above directed with the ſame mixture, but a little deeper. And, when the ſhades are ſtippled and finiſhed, you muſt heighten the lights with pure white, blending them with the firſt colour or ground; but, of what ſort ſoever you make them, you muſt, when they are finiſhed, prepare ſome yellowiſh tints for certain places, laying them on lightly, as it were a waſh, ſo as to be tranſparent, and neither to hide the ſtippling nor the ſhades.

Yellow linens are made of white mixed with a little oker; then proceed and finiſh with biſtre, mixed with white and oker; and, for the deepeſt ſhades, with biſtre alone. Before you finiſh, lay on tints of oker and white here and there, and others of white and ultramarine, as well upon the ſhades as the lights, but very thin; and then ſtipple and ſcumble the whole together, and it will have a fine effect, As you finiſh, touch up the extremities of the lights with maſticote and white. Theſe linens, and the former, you may ſtripe like Egyptian ſcarves, with blue, red, ultramarine, and carmine; a red one between two blue ones, very bright on the lights, and ſtronger in the ſhades.

The heads of virgins are generally dreſſed with veils of theſe ſorts; and of the ſame are made a ſort of handkerchiefs for an open breaſt, becauſe they are very becoming to the fleſh.

When you would have either the one or the other of them to be tranſparent, and ſhew whatever, whether ſtuff or fleſh, is underneath, lay them on at firſt very thin, and mingle with your ſhading colour a little of that which is under them, particularly at the extremities of the ſhades, and touch only the extremities of the lights, only for the yellows, with maſticote and white, and for the whites with white alone.

They are alſo to be made another way, eſpecially when you would have them quite tranſparent, as muſlin, lawn, or gauſe. To this purpoſe, you muſt begin and finiſh what is beneath, as

if nothing was to be over it; then heighten the brighteſt folds with white and maſticote, and ſhade with biſtre and white, or black, or blue and white, according to the colour you aim at, and taking away from the livelineſs of the reſt by ſoiling it over, though that be not altogether neceſſary but for the darker parts.

For crape, do as above, only obſerve, that you draw the folds and the borders or edges with little threads alone, upon what is beneath, which muſt firſt be finiſhed.

When you would water a ſtuff of any ſort, you muſt wave it with lighter or darker colours, according as what you are upon is light or ſhade.

There is ſuch a way of touching your Draperies, ſo as to diſtinguiſh the ſilken from the woollen; theſe are more coarſe and ſtiff, the others are finer, and more free or gloſſy; but it muſt be remembered, that theſe are effects which depend partly upon the ſtuff itſelf, and partly upon the colour of it.

Of colours for DRAPERY.

1. For ſcarlet garments. Take vermilion deeped with cinnabar and heightened with touches of maſticote.

2. For crimſon. Lay on lake very thin, and deepen with the ſame.

3. For purple. Grind lake and ſmalt together, or take blue bice and mix it with red and white lead.

4. For an oriental violet. Grind litmoſe, blue ſmalt, and ceruſs, but let the blue predominate in the mixture.

5. For yellow. Take maſticote deepened with brown oker and red lead.

6. For carnation. Grind ceruſs well waſhed with red lead or ceruſs and vermilion.

7. For a ſtraw colour. Take maſticote, then white heightened with maſticote and deepened with pink; or thus; take red lead deepened with lake.

8. For yellowiſh. Take thin pink deepened with pink and green.

9. For a light purple. Mingle ceruſs with logwood water, or take turnſole mingled with a little lake, ſmalt, and pica.

10. For blue. Take azure deepened with Indy blue or lake heightened with white.

11. For a light blue. Take blue bice, heightened with ceruſs or ſpodium.

12. For a ſky colour. Take blue bice and Venice ceruſs, but, if you would have it dark, take ſome blue and white.

13. For a pure green. Take verdigreaſe, bruiſe it and ſteep it in muſcadine for twelve hours; then ſtrain it into a ſhell, to which add a little ſap green, but put no gum thereto.

14. For

14. For a popinjay green. Take a perfect green mingled with maſticote.

15. For a peach colour. Take braſil water, logwood, and ceruſs.

16. For a black velvet. Lay the garment firſt over with ivory-black, then heighten it with cherryſtone-black and a little white.

17. For black ſattin. Take cherryſtone-black, then white deepened with cherryſtone-black, and then laſtly ivory-black.

18. For white ſattin. Take firſt fine ceruſs, which deepen with cherryſtone-black, then heighten again with ceruſs, and fine touches where the light falls.

19. For a ruſſet ſattin. Take Indy blue and lake, firſt thin, and then deepened with Indy again.

20. For to ſhadow ruſſet. Take cherryſtone-black and white, lay a light ruſſet, then ſhadow it with white.

21. For a changeable ſilk. Take water of maſticote and red lead, which deepen with ſap green.

22. For a hair. It is made out of maſticote, umber, yellow oker, ceruſs, oker de luce, and ſea-coal.

23. For a fire colour. Take maſticote and deepen it with maſticote for the flame.

24. For cloth of gold. Take brown oker and liquid gold water, and heighten upon the ſame with ſmall ſtrokes of gold.

25. For a walnut colour. Take red lead, thinly laid, and ſhadow with Spaniſh brown.

26. For a tree. Take umber and white, wrought with umber deepened with black.

27. For the leaves. Take ſap green and green bice, heighten with verditer and white.

28. For banks. Take thin umber deepened with umber and black.

29. For water. Take blue and white deepened with blue, and heightened with white.

30. For feathers. Take lake frizzled with red lead.

To take the perfect DRAUGHT *of any picture.* Take a ſheet of fine Venice paper, wet it all over with linſeed oil on one ſide, then wipe it off as clean as you can; let the paper lie by till it is thoroughly dry; then you may lay it on any painted or printed picture; then with a black lead pencil you may draw it over with eaſe, put this oiled paper upon a ſheet of clean white paper, and, with a little pointed ſtick or feather out of a ſwallow's wing, draw over the ſtrokes, which you drew upon the oiled paper; and ſo you will have the exact form upon the white paper, which may be ſet out with colours at pleaſure.

Or thus; rub a ſheet of white paper all over with black lead

on one ſide, or elſe with vermilion mixed with freſh butter; lay the coloured ſide on a ſheet of white paper; then lay the picture you would copy out upon the other ſide of the coloured paper, and, with a ſwallow's quill or ſmall-pointed ſtick, go over all the ſtrokes of the picture, and it will be exact on the white paper.

Or thus; lay a piece of lanthorn horn upon the picture, then draw the ſtrokes of your picture with a hard-nibbed pen upon the horn; and, when it is dry, breathe upon the horn twice or thrice, and preſs it hard upon white paper a little moiſtened.

Or thus; take fine lake mixed with linſeed oil and draw with it, inſtead of ink, all the out-ſtrokes of any picture, and other material parts; then wet the contrary ſide of the picture, and preſs it hard upon a ſheet of paper, and it will leave behind it all that which you drew over.

Or thus; grind printer's black fine and temper it with water, and, with a pen dipped in it, draw over the outlines and maſter ſtrokes; then wet ſome white paper with a ſpunge or the like, and preſs it hard upon it, and you will have the ſtrokes you drew upon white paper.

Or thus; lay the print, the backſide of it, upon a clear glaſs or oiled paper; then lay a clean paper upon the print, hold it up againſt the light; ſo will you ſee all the ſtrokes, which you may draw out and ſhadow alſo, if you pleaſe.

Of the imitation of DRAUGHTS.

1. A learner ought to acquire a habit of imitation by many and often trials; which, if it be to be done with the pen, take care to avoid ſcratching and making thin and lean ſtrokes, but rather broad ones drawn from above downwards; but ſome of the hatches muſt be ſharp, ſome broad, ſome unequal, ſome equal, according to the ſhades.

2. Hold the pen or pencil ſomewhat long, and not ſo upright, as is uſual in writing, ſeeming as though you laid it ſtraight forward; and, if you draw with paſtils, uſe yourſelf to turn them in your hand; and this will hinder their growing blunt ſo ſoon.

3. In ſhadowing a Draught you muſt begin firſt to do it faintly and ſmoothly, and ſtraight againſt the edges of the light, ſo that it may look as if it had been daſhed with a bruſh pencil; and then overſhadow it again here and there farther out in the darkeſt ſhades, and adorn it with hatchings; and, where any thing more is required, put it in nimbly and clearly, by gentle touches, which will add a great grace to the work.

4. Doeſling, which is a certain beſmearing of the work, is to be done with crayons of red or black chalk, touching the Draught eaſily, all over ſmoothly and evenly with the points of them, and not with cotton or the like put up into quills, as the practice of

ſome

ſome is; though that may be done in ſome caſes, when one work is to be brought into another.

5. If copies be taken, chiefly upon coloured paper, to make it curious and neat, let the edge of the heightening be ſmoothed a little, not with cotton, but with the like coloured paper, rolled up to a ſharp point at one end; and by this means you may take away the ſharpneſs and hardneſs of the edges, and make them look ſweet and pleaſant.

6. In performing theſe things, a certain kind of waſhing is ſometimes neceſſary, being done with pencils dipped in ſome coloured liquor, and ſo laid upon coloured paper; and this is to be done ſometimes through the whole work, and ſometimes but in part, viz. in ſome principal flat ſhades, which may be afterwards wrought over with a pen or black chalk, and will look very pleaſantly.

7. This waſhing muſt at firſt be done very weak and faint, yet ſmooth, without ſmoothing it at the edges, except by a new ſtroke of the pencil moiſtened with your tongue; for ſuch ſmoothing will ſpoil the work; this firſt waſhing being dry, go over your work again, yet only thoſe parts where there ought to be a darker ſhade; and afterwards again, giving ſome deeper and harder touches without ſmoothing, which will very much ſet your work off.

8. Faint ſhadows and things that are obſcure muſt be repreſented as faintly as may be, chiefly upon coloured paper, where the heightening helps you; but take care not to go too often over the ſhades, leſt you ſpoil them, by making them too hard and ill-favoured.

9. In drawing either a Draught or the life, firſt obſerve the thing in general, in reſpect to the circumferent ſtrokes; for they are thoſe which bound and contain all the parts of the whole, and without which the particular parts can never be perfectly diſtinguiſhed, nor repreſent themſelves in their being. This done, then conſider, in like manner, the parts; and, ſuppoſing the parts each to be a whole, you may come to repreſent the parts of parts, and by the ſame means expreſs the whole of any Draught whatſoever.

The proper materials for DRAWING. And theſe are either black lead pencils, or black lead fixed in a port-crayon, charcoal, red, black, or white chalk, paſtils or crayons, pens or hair pencils, and Indian ink.

Black lead is as proper in the beginning to practiſe after the plain lines, &c. as any other material; the ſtroke it makes, being ſmooth, will pleaſe the young learner better than what is effected by charcoal or crayons.

Slope your lead with a penkniſe to a fine point, that it may

caſt a ſmall neat ſtroke, if it is not made into a pencil; then fix your piece of lead into a port-crayon; and, whatever you ſketch with, accuſtom yourſelf from the beginning to hold them long in your hand, that the end of your fingers may be at a much larger diſtance from the point than they are from the nib of a pen in writing; and form your ſtrokes with light gentle touches; by theſe means they will have a greater command of hand, and your outline will be more free and bold.

When you begin to practiſe after limbs and figures, it will be uſeful to draw the rough ſketch with charcoal, the ſtrokes made therewith being eaſily diſcharged from the paper.

Your charcoal muſt be ſlit into ſmall ſlender pieces, to fix in a port-crayon, for the better conveniency of holding it; you muſt then ſharpen it to a proper point, and with a light hand ſketch after your original as correctly as you can; what you diſapprove of in this performance may eaſily be wiped out, by gently bruſhing that part with a feather or clean rag.

Your outlines being ſecured with your charcoal, wipe them in a ſlight manner with a feather that it may appear faint; then go over your lines with your black or red lead, making them yet more correct, if you can: When this is done, if upon reviewing it there appear any errors you would amend, you may diſcharge the paper of what part of the Drawing you pleaſe, by rubbing that part with the crumb of a ſtale white loaf, red lead, and red or black chalk, which are uſed in the ſame manner as black lead.

White chalk and tobacco-pipe clay are uſed in heightening or giving ſtrong lights, and in Drawing on coloured paper.

Paſtils or crayons, are any colours, mixed with tobacco-pipe clay, which, while ſoft and in the conſiſtency of a paſte, is rolled up in pieces about the thickneſs of a quill, and two or three inches in length, and then dried; they are generally uſed on coloured paper, but never in a way of hatching, as black or red lead many times are; but the colours are rubbed and wrought one into another, in ſuch a manner that no ſtrokes appear, but the whole looks as if it were done with a bruſh.

This is a very quick and expeditious manner of Drawing; and, when the crayons are handled with judgment, they never fail of a delicate ſoftneſs and fine expreſſion; but this muſt be obſerved, that the touch of a rude finger, unacquainted with the performance, may eaſily ſpoil the fine work, while only handling it to look on it; therefore it ſhould not be forgot to preſerve it in books, or under glaſſes in frames. The grain of the paper on which they are uſed ſhould be a little rough, the crayons working eaſier and expreſſing themſelves ſtronger than when the paper is ſmooth; if it is a little dark or browniſh, near the colour of whited-brown paper,

per, it yields a good relief to the tender parts of the work, by ſhewing the light ſtrokes of the work. Pens are ſometimes uſed in ſhading draughts, in hatching them with croſs ſtrokes; but this is better performed with hair pencils and Indian ink, which are not only uſed in hatching by ſtrokes, but in ſhading after a far more expeditious manner, viz. by waſhing, which is the ſame in water-working with hair pencils and Indian ink, as with hair pencils and water-colours. The ſhades in hatching are effected by lines, and appear in the ſtrokes, whilſt in an engraven print, contrary to this in waſhing, there do not appear any lines, but the ſhades look like thoſe in metzotinto prints.

General precepts in DRAWING. 1. Begin with plain geometrical figures, as lines, angles, triangles, quadrangles, polygons, arches, circles, ovals, cones, cylinders, and the like; for theſe are the foundations of all other proportions.

2. The circle is uſeful in all orbicular forms, as of the ſun, moon, globes, &c. the oval, in giving a juſt proportion to the face and mouth, &c. the ſquare confines a picture you are to copy, &c. the triangle is of uſe in Drawing a ſide or half face; angles and arches in perſpective; the polygon, in ground-plats, fortifications, &c. the cone, in ſpires, ſteeples, tops of towers, &c. and the cylinder, in columns, pillars, pilaſters, &c.

3. Having brought your hand to be fit and ready in general proportions, inure yourſelf to give every object its due ſhade, according to its concavity or convexity, and to elevate or depreſs the ſame, as the object appears either nearer or farther off the light; which is indeed the life of the work.

4. The ſecond practice of Drawing conſiſts in forming fruits, as apples, pears, cherries, peaches, &c. with their leaves; the imitation of flowers, as roſes, tulips, carnations, &c. herbs, trees, &c. of different kinds.

5. The third in the imitation of beaſts, fowls, fiſhes, &c.

6. The fourth practice of Drawing conſiſts in the imitation of the body of man, with all its lineaments, as head, noſe, eyes, ears, cheeks, hands, arms, and ſhadows, all exactly proportioned, both to the whole and to one another, both as to ſituation and magnitude.

7. The fifth is in the drapery, in the imitation of cloathing and artificially ſetting off the outward coverings, habit, and ornaments of the body, either of cloth, ſtuff, ſilk or linen, in their natural and proper folds.

8. In Drawing of all the forms before-mentioned, it is requiſite to be firſt perfect in the laying down the exact proportions; ſecondly in the general or outward-lines, before you proceed to ſhadowing or trimming the work within.

9. In mixed and uncertain forms, where the circle, ſquare, &c.

&c. will be of no uſe, but only the idea thereof in your own fancy, as horſes, oxen, and the like; you muſt do it by judgment, and ſo gain the true proportions by aſſiduous practice, in the following manner:

Having the ſhape of the thing in your mind, firſt draw it rudely with a coal, then with more exactneſs with a lead or pencil; then peruſe it well, and mend it in thoſe parts you find you have erred, according to the idea you carry in your mind. Then view it over again, correcting the other parts by degrees, to the greateſt exactneſs you poſſibly can, though you do it twenty or more times over. When you have mended it as well as you can by your own judgment, compare it with ſome good pattern or print of the like kind, and amend it by that, giving every thing its due proportion.

10. Having good copies or patterns to draw after, learn to reduce them to other proportions, either larger or ſmaller, and this by often and many trials.

11. When the young artiſt can do the before-mentioned very well, let him begin to practiſe in Drawing, wherein the liberty of imitation is preſented in the greateſt latitude; and this muſt be attained by much practice, and diligent exerciſe, and the inſtructions of a good maſter.

12. Let a perfection in Drawing be attained, before there be any attempts as to colouring and painting; for, after the firſt is attained, all belonging to the latter will be eaſily underſtood and gained by practice.

Particular obſervations with regard to DRAWING. 1. If you draw after a print or picture, place it in ſuch a light that the gloſs of the colours may not interrupt your light, but ſo that the light and your eye may equally and obliquely fall upon the piece, which ſhould be placed at ſuch a diſtance, that, upon opening of your eyes, you may view it all at once; the larger the picture is, the greater diſtance off it ſhould be placed, and which muſt be right before you and a little reclining.

2. Draw all your outlines at firſt very faint with a coal, which may eaſily be rubbed out with the feathers of a duck's wing or a crumb of bread, which ſo may be the more eaſily mended, but will be more difficultly rubbed out, if you lean hard on your coal, and draw very black.—The outlines ought to be drawn true and agreeable to the pattern, before you begin to ſhadow any part of it. Thoſe outlines which are next the light, ſhould be drawn very ſoft and faint; when you have drawn one feature, that ſhould in ſome meaſure be a direction to you to draw the other, by obſerving with your eye the diſtance from that to the next feature, making a ſmall mark at the place with your coal,

coal, and then draw it, and ſo to the next, till you have drawn the whole figure.

3. Then obſerve the middle of the picture you would copy, and touch upon the paper with the point of your coal; then obſerve the more perſpicuous and uppermoſt figures, if there are more than one, which you are to touch lightly in their proper places. Thus, running over the whole draught, you will ſee, as it were, the ſkeleton of the piece you would draw: But, if you proceed without theſe conſiderations of what your draught will run to, when you have ended your work, you will be forced to draw the ſame many times over and over again, and perhaps every time to as little purpoſe; by the tedioufneſs of which, your ingenuity will be dulled or diſcouraged.

4. Take care to draw a juſt and true draught, although you advance in it but ſlowly; it may be better to beſtow two or three days, at times, on a piece you may think you can do in two or three hours.

5. Having made theſe out-ſketches, view them diligently, if they anſwer your pattern or not; for the geſtures of the life ought to ſhew themſelves eminently in the firſt and rudeſt draughts thereof; without which, it is certain your work will be faulty.

6. When you have viewed theſe ſketches, begin to correct and amend them, wherever you perceive any thing amiſs, adding and diminiſhing by degrees, a little here and there, wherever you ſee it vary from your pattern; and by this method it will be brought nearer and nearer to the life.

7. Obſerve the diſtance of one limb, joint, or muſcle from another; and the ſame in all other accidents of the figure, their length, breadth, largeneſs, thickneſs, turnings, ſhadows, &c. Shadow next to the light very faintly; and, where you ſee bold and free touches, be not timorous in expreſſing the ſame.

In drawing a head, from the life or otherwiſe, take care to place the features exactly right upon the croſs lines, whether it be a full face or a three quarter face, as you ſee in the examples.

In foreſhortening, you muſt make the croſs lines to fly upwards, where they look upwards; but, where the aſpect is downwards, they muſt be made downwards in a circular manner.

Having drawn the outlines true with a coal, then you are to proceed to trace the ſame lines over again with a pen, Drawing them with more exactneſs; and, by imitating all the hatches, with their exact diſtances one from another, their croſſings, turnings and windings, with much boldneſs and freedom, perfect your deſign. This may eaſily be done with charcoal, becauſe what is amiſs may be wiped out.

8. If you draw after plaiſter and imboſſed works, chuſe a good north light, which light ſhould deſcend from above, not dilating

dilating and ſcattering itſelf too much, by which the work may be more pleaſantly ſhaded. If the room has a ſouth light, place ſome oiled paper before the window; and, if you draw by candle-light, make uſe of a lamp, ſhaded with oiled paper; for a candle will, by burning, grow lower, and lower, which will cauſe the ſhades to change; all which may be avoided by a lamp.

9. Place yourſelf about three times as far from the pattern as the pattern is high, ſo that your eye may view it in a direct line; then take an obſervation with a plumb-line, what part of the pattern appears to you, by extending it ſtraight, and how they come in ſight one under another, and accordingly take your fundamental ſketches, as has been before directed.

10. In order to draw the muſcles of a human body, you muſt have either the life or very good patterns, of which there are a ſufficient number to be found in anatomical books; from whence the alterations and changes, riſings and fallings, extenſions, contractions, and other operations of the muſcles, arteries, and particular members, in imitation of the life, may be excellently drawn.

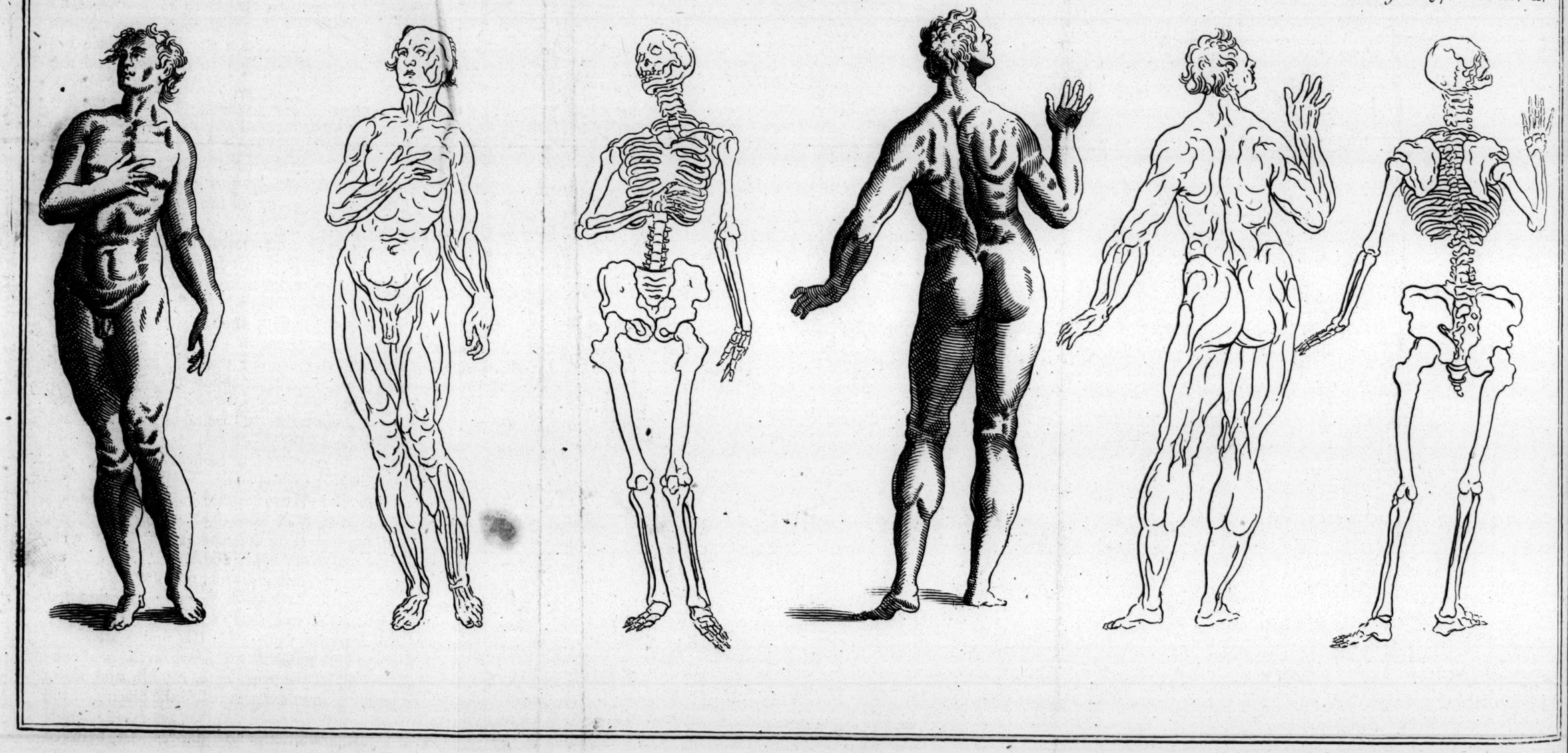
11. In Drawing after a naked body, all the muſcles are not to be ſo plainly expreſſed as in anatomical figures; but that ſide, whoſe parts are moſt apparent and of ſignification in the performance of any action, muſt be made to appear more or leſs, according to the force of that action.

12. In Drawing of young perſons, the muſcles muſt not appear manifeſtly ſo hard, as in elder and full grown perſons: The ſame is to be obſerved as to fat and fleſhy perſons, and ſuch as are very delicate and beautiful: And in women ſcarce any muſcles at all are to be expreſſed, becauſe that in the life they do either not appear at all, or but very little, unleſs it be particularly in ſome forcible action, and then too they are to be repreſented but very faintly, leſt the ſingular beauty of the body be thereby ſpoiled. The like is alſo to be obſerved as to little children.

13. The motion of the whole body muſt be conſidered in Drawing of the muſcles; as, in the riſing or falling of the arms, the muſcles of the breaſt do appear more or leſs: The hips do the like, according as they bend outward or inward; and it is the ſame chiefly in the ſhoulders, ſides, and neck, according to the ſeveral actions of the body; all which alterations are firſt to be be obſerved in the life.

14. The breadth and largeneſs of a picture is alſo to be conſidered; it ſhould be larger about the legs and garments, ſhewing it ſlender above, as it were pyramidically, by diſcovering one ſhoulder and hiding the other, which is ſhortened by turning the body.

15. But ſometimes the figure is to be repreſented biggeſt in the



the upper parts, by repreſenting either both the ſhoulders or both the arms, ſhewing the one leg and hiding the other, or both of them after one manner, as the diſcretion of the artiſt ſhall ſee meet.

16. Neither ought this to be obſerved only in the whole body, but even in every part; ſo that in the legs, when a muſcle is raiſed outwards on the one ſide, that which is directly on the contrary ſide muſt be drawn in and hid, for ſo it appears in the life.

17. The proportion of the figure ought to be multiplied by degrees, in proportion of one to two, three, four, &c. for herein the chief ſkill conſiſts; the diameter of the biggeſt place between the knee and the foot is double to the leaſt, and the largeſt part of the thigh triple.

Of DRAWING *the face.* 1. In Drawing of a face, the firſt thing to be done is to obſerve its motion, whether upwards, downwards, forwards, or ſideways; whether it be long or round, fat or lean, big or ſmall: For, if the face be fat, the cheeks will ſeem to ſwell; if lean, the jaw-bones will ſtick out, and the cheeks fall in; but, if it be neither too fat nor too lean, it will be for the moſt part round.

2. Touch the features, where the eyes, noſe, mouth, and chin ſhould ſtand, lightly, after you have firſt drawn the circle or oval of the face; then make a ſtroke down from that place, which is even with the chin, drawing it down where the middle or tip of the noſe and middle of the mouth ſhould be placed; which ſtroke muſt be made ſtraight down, in a full right face, but arched or oval in an oblique face, leaning that way towards which the face turns; then croſs that ſtroke about the middle of the eyes, either with a ſtraight line, in a right face, or with a curved line, either upwards or downwards, according to the preſent action or poſture of the face; then make another anſwerable to that, where the end of the noſe ſhould come, and another for the mouth, that it be not made crooked.

3. This croſs is difficult to be underſtood in plano; but, upon a face made upon a ſolid body in form or ſhape of an egg, the ſeveral variations of the ſaid croſs are moſt excellently demonſtrated; and a learner may from hence underſtand all the variations of a face, and thereby draw it all manner of ways, as upwards, downwards, forwards, backwards, ſideways, &c. and that only by the motion of the ſaid oval ſolid, accordingly as you may eaſily perceive in the figures on plates II, III, and XVI.

4. Then, if the face look upwards towards heaven, or downwards towards the earth, let the eyes, noſe, mouth, and brows look accordingly with it; and next proceed to the placing of the features.

5. In a face of a juſt proportion, the diſtances, 1ſt, between

the top of the forehead and the eye-brows; 2d, between the eye-brows and the bottom of the noſe; 3d, between the bottom of the noſe and the bottom of the chin, are equal.

6. In Drawing the utmoſt circumference of a face, take in the head and all with it, leſt you ſhould be deceived in Drawing the true bigneſs.

7. Then you are to conſider all thoſe chief touches, which give life to a face, adding a grace to it, and ſomething that ſhall alſo diſcover the diſpoſition of the mind.—So, the mouth extended, and the corners turning a little up, ſhew a ſmiling countenance. The eye-brows bending, and the forehead and top of the noſe, between the eye-brows, wrinkled, repreſent a frowning countenance. The upper eye-lid, coming ſomething over the ball of the eye, ſhews a ſober and a ſtayed countenance.—There are alſo many other touches, which give life and ſpirit to a face, which you may find out by degrees, by making careful obſervations on good prints.

8. The diſtance between the eyes ſhould, in a full face, be the length of one eye; but it is to be leſſened proportionably in a three quarter or half face; and the noſtrils muſt be placed exactly under the corners of the eyes.

9. When you have given touches where the eyes, noſe, mouth, and chin are to be placed, then begin to draw them more exactly, and ſo proceed till you have finiſhed the face; after which, draw the hair, beard, ſhadows, &c. and other things about it.

10. You muſt take great care to place the ſhadows right, and be ſure not to make them too dark, where they ſhould be faint; becauſe they can never be rendered lighter afterwards, and ſo the whole face will be ſpoiled. And remember that the ſhadows muſt be more faint and light in a fair face than in a ſwarthy one.

11. When you have finiſhed the face, give here and there ſome hard touches with your pen, where the ſhadows are to be darkeſt; then proceed to the ears and hair, firſt Drawing the outline, and afterwards the principal curls or maſter ſtrokes in the hair; and theſe will be a guide to you, as to the leſſer curls, which depend upon the firſt; taking care to make the curls to bend exactly according to the pattern, that they may lie looſely or careleſly, and not ſtiff and forced; having drawn the curls, ſtrike in the looſe hairs, which hang ſcatteringly out of the circles.

12. In forming the ear, deſcribe an oval as it were, and, proceeding lightly, join ſtroke to ſtroke in ſuch manner as you ſee in the figures, ſo that the ear may be intirely formed, without any digreſſion from the bounds of nature or art.

13. In the laſt place, having practiſed by rule, till you have brought your hand in, in Drawing of any thing, firſt ſtroke the outlines, the principal veins and muſcles lightly, and ſhadow them

them afterwards, always making uſe of the beſt copies or prints, which will both increaſe your judgment, and bring you to a good command of hand.

Of DRAWING *the extreme parts.* 1. In Drawing the hands, do not draw all the joints, veins, or other things to appear plainly, but only lightly and faintly; and ſtrike out the ſize of the hand, and the manner of its turning with faint touches, and not with hard ſtrokes.

2. After you have done this, part the fingers according to your pattern, with faint ſtrokes alſo; then mark the place where any of the fingers ſtand out from the others with a faint reſemblance.

3. Proceed to draw theſe parts more perfectly, making the bending of the joints, the wriſts, and other principal parts more exactly; then go over them again, Drawing every ſmall bending or ſwelling of the fingers, nails, knuckles, and veins, ſo many of them as do appear.

4. Acquaint yourſelf, from good prints, with the juſt proportions of the hands, with their equal diſtances, always obſerving this rule, according as it turns, either one way or the other, to ſhorten in proportion as they appear to the eye. For, ſo much as it turns away from our eye, ſo much it loſes in proportion; nay, ſometimes a whole finger, two or three, or more, is loſt to our ſight, to which the draught muſt be made to anſwer.

5. In Drawing of feet, the ſame rules are to be obſerved, that are laid down for Drawing of hands.

Of DRAWING *the whole body.* 1. Begin with the head, and be ſure that you give it its juſt proportion, anſwerable to what you intend the whole body ſhould be; then draw the ſhoulders in their exact breadth, next to them the trunk of the body, beginning at the arm-pits, and ſo Drawing down to the hips on both ſides, obſerving withal the exact breadth of the waiſt; and, in the laſt place, draw the legs, arms, and hands, according to your pattern.

2. Firſt draw with a coal, and alſo very lightly and faintly, not Drawing any thing perfect, that it may be the eaſier mended when it is amiſs; and, when this has been done, finiſh one thing after another as curiouſly as you can.

3. Let thoſe joints, ſinews, muſcles, and veins, which are parallel, be placed oppoſite to one another in a ſtraight line, as ſhoulder to ſhoulder, hip to hip, knee to knee, &c. in order to this, draw ſtraight croſs lines for your guide; obſerving that, which way ſoever the body turns or bows, theſe lines may anſwer accordingly.

4. Place all perpendicular joints and parts in a right line one under another, as you ſee them in your pattern. For which

purpoſe draw a ſtraight line, if the body be ſtraight, from the throat, through the middle of the breaſt and privities to the feet, to which line draw all thoſe particular points parallel, that the body may not appear crooked or awry.

5. In the bowings and bendings of the body, let the extuberance of the outward part be juſt equal to the compreſſion of the inward part, making all things of an equal proportion, that the oppoſite parts may be equal, as arm to arm, leg to leg, &c. ſo every part may be proportional to each other, as the hand not too big for the arm, nor the arm for the body, nor the body for the legs, &c. only with this difference, that, as the one part may appear fully to the eye, or the other may turn away, either in part or the whole, or be ſeen ſideways, it may be made ſo much leſs than the other, by ſo much as it turns away from the ſight.

6. As a juſt proportion is to be obſerved in bigneſs, ſo alſo muſt it in length, ſo that every oppoſite part may not be too long one for another, but according to the propoſed magnitude; and in this caſe, that, if the body be awry, or any ways hid, thoſe parts may ſhorten accordingly, to what is out of ſight.

7. The juſt diſtance of one thing from another, for by that means you will be more exact in your draught, and be able in a little time to imitate either pattern or nature more perfectly.

8. If you draw a labouring man, you muſt repreſent him with ſtrong limbs and raiſed muſcles, ſwelling and ſtanding out; eſpecially in bearers of burthens, drawing of weights, leaping, walking, combating with weapons, or ſuch-like violent exerciſes.

9. In repreſenting perſons aſleep, you muſt carefully avoid giving any ſuch poſture or actions in their lying, as will not, in all probability, give them leave to ſleep. For the weakneſſes and want of judgment in the artiſt will appear in repreſenting their limbs or bodies ſupported by their own force, and not by the help of ſome other thing.

Of DRAWING *a naked body.* In Drawing after the life, as there are great variety of faces, ſo no certain rules can be delivered for it; yet the following precautions may be of uſe.

1. Draw the head in an oval, one fourth part for the hair, one fourth part for the forehead and brows, one fourth for the noſe, and the laſt for the mouth and chin.

2. Having drawn the head, meaſure out eight times the length of it, the head making one of the eight parts, and draw a ſtraight line from the top of the head to the ſole of the foot.

3. Let there be one head's length from the chin for the breaſt, and the next eighth part will reach to the navel, the fourth part to the privities, the fifth part to the middle of the thigh, the ſixth part to the lower part of the knee, the ſeventh to the ſmall of the leg, and the eighth part to the heel.

4. You



4. You muſt take care to draw the muſcles exactly as they are in the life; the breadth of the ſhoulders ſhould be about two meaſures of the head, the breadth of the hips two meaſures of the face; the arms, as ſtretched out to their full length, are juſt the length of the whole figure, the breaſts alſo accounted; but without the breaſts they are but ſix.

5. The arms, when they hang ſtraight down, reach within a ſpan of the knee; the length of the hand is the juſt length of the face.

6. Let the head be drawn firſt with the utmoſt exactneſs, and next to that the ſhoulders in their juſt breadth; after theſe draw the trunk of the body, and the reſt in order as before directed.

7. Let the joints, muſcles, ſinews, &c. be all placed in their proper and natural places, and alſo be proportionable as to magnitude, ſimilitude, and parts, leſt it ſeem crooked and deformed.

8. Let every parallel joint have a moderate bending ſo as to anſwer its oppoſite in nature.

9. It will be of great advantage to practiſe much Drawing after the life, and after good prints of anatomy, and ſtatues made of plaiſter of Paris, which is the only way to arrive at the perfection of Drawing a naked figure well. See plate VII.

10. A picture ought alſo to be quick, free, and lively; and, if there be many of them in one piece, they ought to be ſo ordered, as not to appear crowded, or to fall offenſively; but being diſpoſed gracefully, on the fore ground eſpecially, ſo to manage the whole, that the reſt of the figures decline and leſſen proportionably and gradually, both in magnitude, height, and ſtrength according to their ſeveral diſtances. See plate VIII. and IX.

DRAWING *of mixed and uncertain forms.* 1. In order to the Drawing the form of any beaſt, begin at the forehead with the lead or coal, Drawing downward the noſe, mouth, upper and nether chop, ending the line at the throat.

2. Then viewing it again where you begun, from the forehead over the head, ears and neck, continuing till you have given the full compaſs of the buttock; then mark out the legs and feet.

3. Viewing it again, touch out the breaſt with the eminency thereof; laſtly finiſh the tail, paws, tongue, teeth, beard, and ſeveral ſhadows.

4. In Drawing beaſts, you muſt be well acquainted with their ſhape and action, without which you will never perform any thing excellent in that kind; and here, if you draw it in an emblem or the like, you ought to ſhew the landſcape of the country natural to that beaſt.

5. In birds begin alſo the draught at the head, and beware of making it too big; then bring the breaſt line, from under the

throat, down to the legs; there ſtay and begin at the pinion to make the wing, which, being joined to the back-line, will be preſently finiſhed.

6. The eye, legs, and train, muſt be drawn laſt, always letting, in birds as in beaſts, the fartheſt leg be ſhorteſt; their feathers are the ſame to them as the hair in beaſts, and therefore muſt take their beginning at the head very ſmall, and fall in one way backwards in five ranks, greater and greater to the concluſion.

7. Inſects, as flies, bees, waſps, graſhoppers, worms, and ſuch-like are eaſily to be drawn, and not hard to be laid in colours; in doing theſe, it will at firſt be abſolutely neceſſary to have the living pattern before your eyes.

8. To draw a flower, begin from the roſe-tuft or wart in the middle, as in a roſe or marigold, with the yellow tuft, which being made, draw lines equally divided from thence to the greateſt compaſs or extent of the flower.

9. They may be drawn either fully open or in the bud, and then, with the coal or lead, may be drawn rudely the leaves, giving them afterwards their veins or jaggedneſs.

10. To take the natural and lively ſhape of the leaf of any herb or tree. Take the leaf you would have, and gently bruiſe the ribs and veins on the backſide of it; afterwards wet the ſide with linſeed oil; and then preſs it hard upon a piece of clean white paper, and ſo you ſhall have the perfect figure of the ſaid leaf with every vein of it ſo exactly expreſſed, as, being lively coloured, it will ſeem to be truly natural.

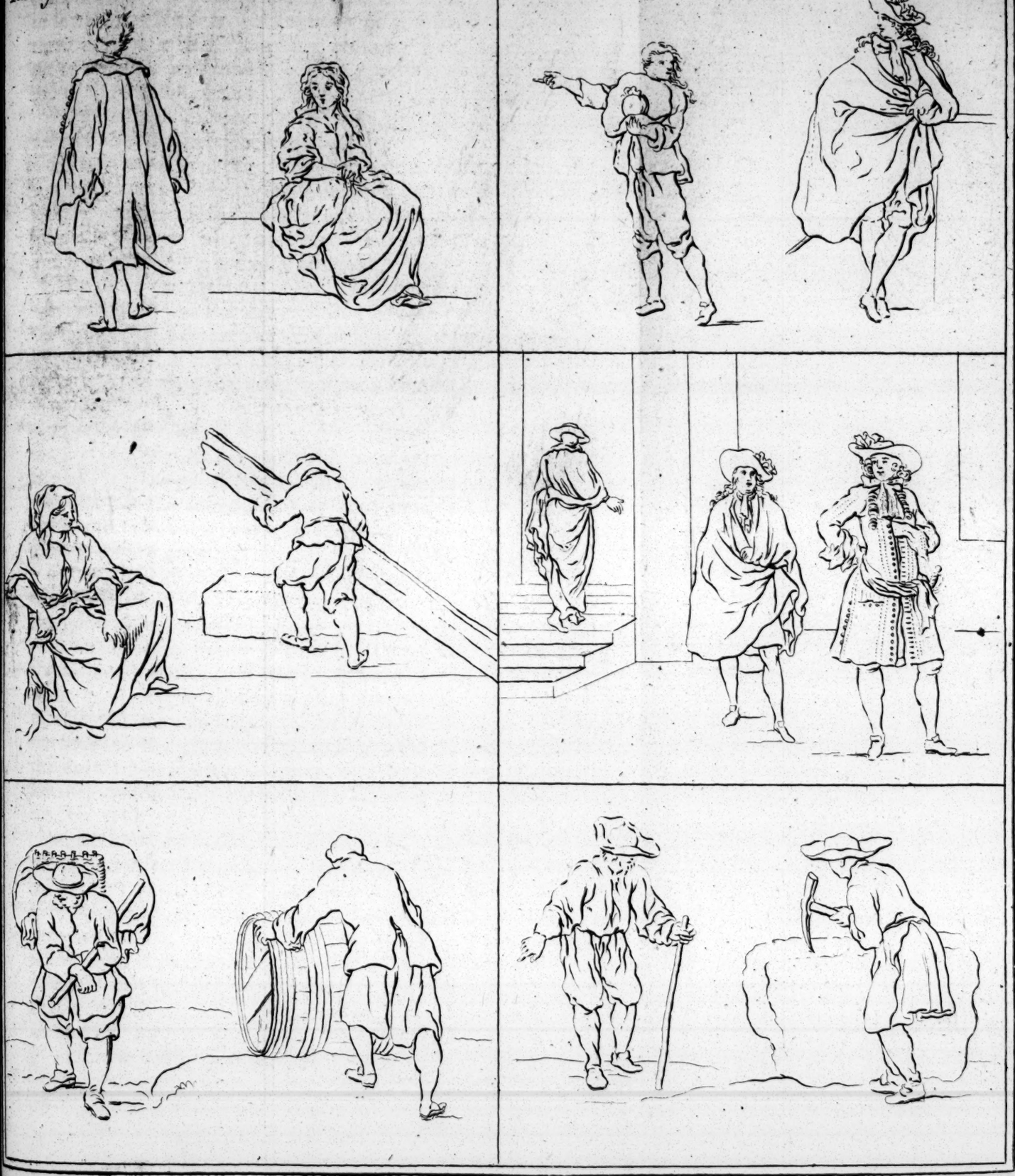
For the method of Drawing various figures, in one piece, and managing the lights and ſhades to the beſt advantage, ſee COMPOSITION.

A very curious method of DRAWING *all perſpective in the moſt natural manner, without obſerving the rules.* It may be of good ſervice to ſuch as love painting, and take pleaſure in practiſing the ſame, without being willing to be at the pains of opening the compaſſes, or taking up the ruler to draw lines. For, in this method, neither the one nor the other are required; and yet the fineſt draughts may be made hereby of buildings, gardens, landſcapes, &c. See plate X, fig. 1.

Before we come to the method itſelf, it muſt be obſerved that the principal requiſite therein is a large piece of fine clear glaſs, fitted into a wooden frame, at A, fig. 2.

This frame is to ſlide between two cheeks or pieces of wood, an inch and an half thick, which are raiſed at the two extremes of a board the breadth of the frame, i. e. about a foot broad, as ſhewn in B C, which is diſpoſed to receive the frame A.

In the middle of the board one or more ſquare holes muſt be made



throat, down to the legs; there ſtay and begin at the pinion to make the wing, which, being joined to the back-line, will be preſently finiſhed.

6. The eye, legs, and train, muſt be drawn laſt, always letting, in birds as in beaſts, the fartheſt leg be ſhorteſt; their feathers are the ſame to them as the hair in beaſts, and therefore muſt take their beginning at the head very ſmall, and fall in one way backwards in five ranks, greater and greater to the concluſion.

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9. They may be drawn either fully open or in the bud, and then, with the coal or lead, may be drawn rudely the leaves, giving them afterwards their veins or jaggedneſs.

10. To take the natural and lively ſhape of the leaf of any herb or tree. Take the leaf you would have, and gently bruiſe the ribs and veins on the backſide of it; afterwards wet the ſide with linſeed oil; and then preſs it hard upon a piece of clean white paper, and ſo you ſhall have the perfect figure of the ſaid leaf with every vein of it ſo exactly expreſſed, as, being lively coloured, it will ſeem to be truly natural.

For the method of Drawing various figures, in one piece, and managing the lights and ſhades to the beſt advantage, ſee COMPOSITION.

A very curious method of DRAWING *all perſpective in the moſt natural manner, without obſerving the rules.* It may be of good ſervice to ſuch as love painting, and take pleaſure in practiſing the ſame, without being willing to be at the pains of opening the compaſſes, or taking up the ruler to draw lines. For, in this method, neither the one nor the other are required; and yet the fineſt draughts may be made hereby of buildings, gardens, landſcapes, &c. See plate X, fig. 1.

Before we come to the method itſelf, it muſt be obſerved that the principal requiſite therein is a large piece of fine clear glaſs, fitted into a wooden frame, at A, fig. 2.

This frame is to ſlide between two cheeks or pieces of wood, an inch and an half thick, which are raiſed at the two extremes of a board the breadth of the frame, i. e. about a foot broad, as ſhewn in B C, which is diſpoſed to receive the frame A.

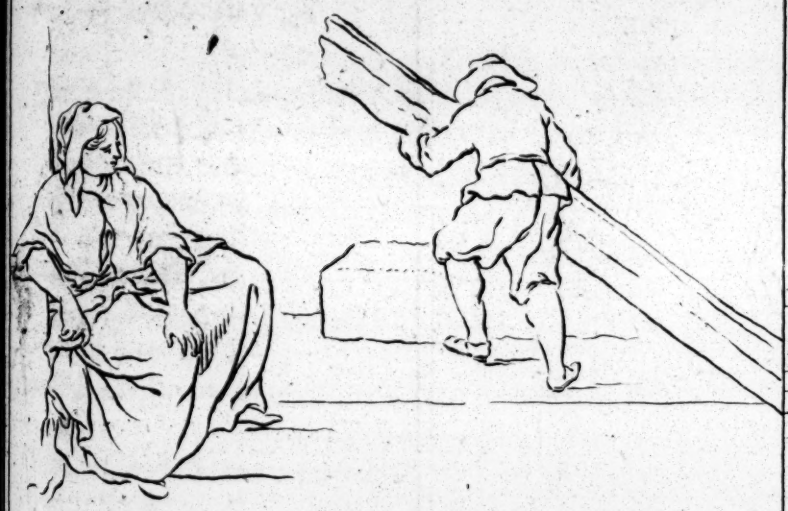
In the middle of the board one or more ſquare holes muſt be made

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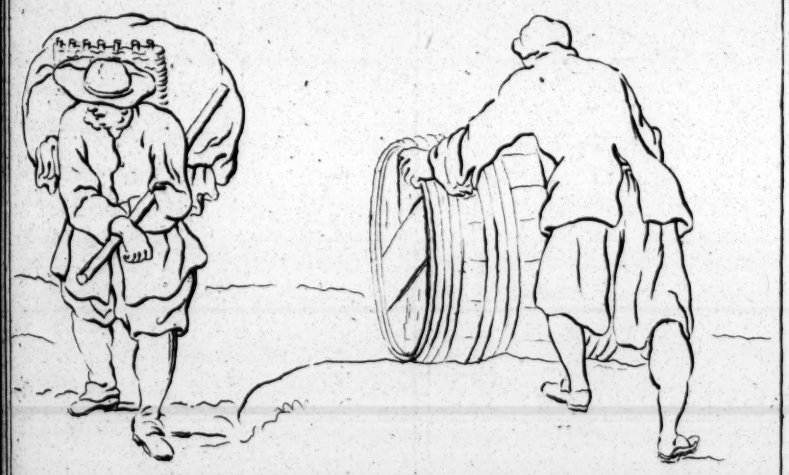
Plate. IX.













made as in E, to receive the ſlit ruler F, ſo as it may be raiſed or lowered at pleaſure. At the top of which ruler is a circle of three or four inches diameter; but very thin, being made of tin or the like, and having a little aperture about the ſize of a pea in the middle; the whole is repreſented together at G.

Now, though the mere figure ſhews the application, yet I will deſcribe the method of proceeding.

Having therefore placed the inſtrument G before the object you would draw, look through the little hole or ſight F, and, if you ſee all the propoſed objects repreſented on the glaſs, the inſtrument is fixed; otherwiſe bring the ſight nearer the glaſs, till you ſee the whole of what is required.

The piece being thus rectified, you are to draw on the glaſs every thing that you ſee thereon through the hole F, which has the ſame effect here as the point of ſight in other methods. And it is certain, that every thing thus drawn on the glaſs, the eye being fixed to the little hole, will be according to the ſtrict rules of perſpective. See the whole repreſented fig. 1.

In order to take off what is thus deſigned on the glaſs, draw the lines and figures on glaſs with ink; then wetting the backſide of the glaſs a little, and laying a moiſt ſheet of paper on the ſide that has the deſign; rub or preſs the paper gently thereon, and the whole draught will be impreſſed or transferred from the glaſs upon the paper.

Some adviſe to make uſe of a pencil and colours; but, in ſhort, every body is left to their own diſcretion; it is enough to know the method in general.

A deſign of a palace is as eaſily taken this way as a landſcape; and a church as a houſe or chamber; all required, in any of them, being to pitch on a place where the whole thing to be repreſented may be ſeen; and to bring the ſight to the proper nearneſs to the glaſs. A painter may uſe the ſame method for the drawing of figures, poſtures, &c. from nature, ſtatues, relievo's, and in ſhort every thing; it being certain that a little practice will render the method exceeding feaſible and eaſy.

Another elegant manner of DRAWING *in perſpective.* This method is as curious as the former; and ſome even prefer it, by reaſon there is a double draught required in that; one on the glaſs, and a ſecond copied or imprinted from it; whereas, in the preſent method, only a ſingle draught is made, and that as exactly as the former.

I ſhall not deſcribe the ſtructure of this inſtrument; it being the ſame with that already mentioned, excepting that the frame, inſtead of the glaſs fitted in it, muſt be divided into a number of little ſquares by fine threads, drawn at equal diſtances from

each ſide of the frame acroſs each other, forming what we call a reticula, or lettice. See plate X, fig. 2.

As to the number of ſquares, that is left to diſcretion; all that is neceſſary to be added, is, that they muſt not be too large, that you may work the more exactly; nor too ſmall, for fear of being confuſed.

For the practice; place the piece H in ſuch manner, as that you may ſee all the objects you mean to deſign through the hole of the ſight I.

If the deſign ſhould be larger than the compaſs of the frame or reticula, your chequer ſquares muſt be made on the cloth or paper larger than thoſe of the frame.

If the deſign be intended ſmaller on the cloth, &c. than the frame, make the ſquares leſs; otherwiſe they are to be of the ſame ſize.

But in all the caſes make the ſame number of ſquares on the paper, &c. as are in the frame when you look through the ſight I.

Thus transferring proportionably from the ſquares in the one to the correſponding ones in the other, the perſpective will be as juſt, as if you had gone by the ſtrict rules, and uſed the compaſs, ruler, &c.

The two figures ſhew how the piece H is to be placed, in order to deſign on a table; the expedient is of excellent uſe in painting, and ſerves to draw very exactly any perſpective draught, to copy paintings, draw to the life, &c.

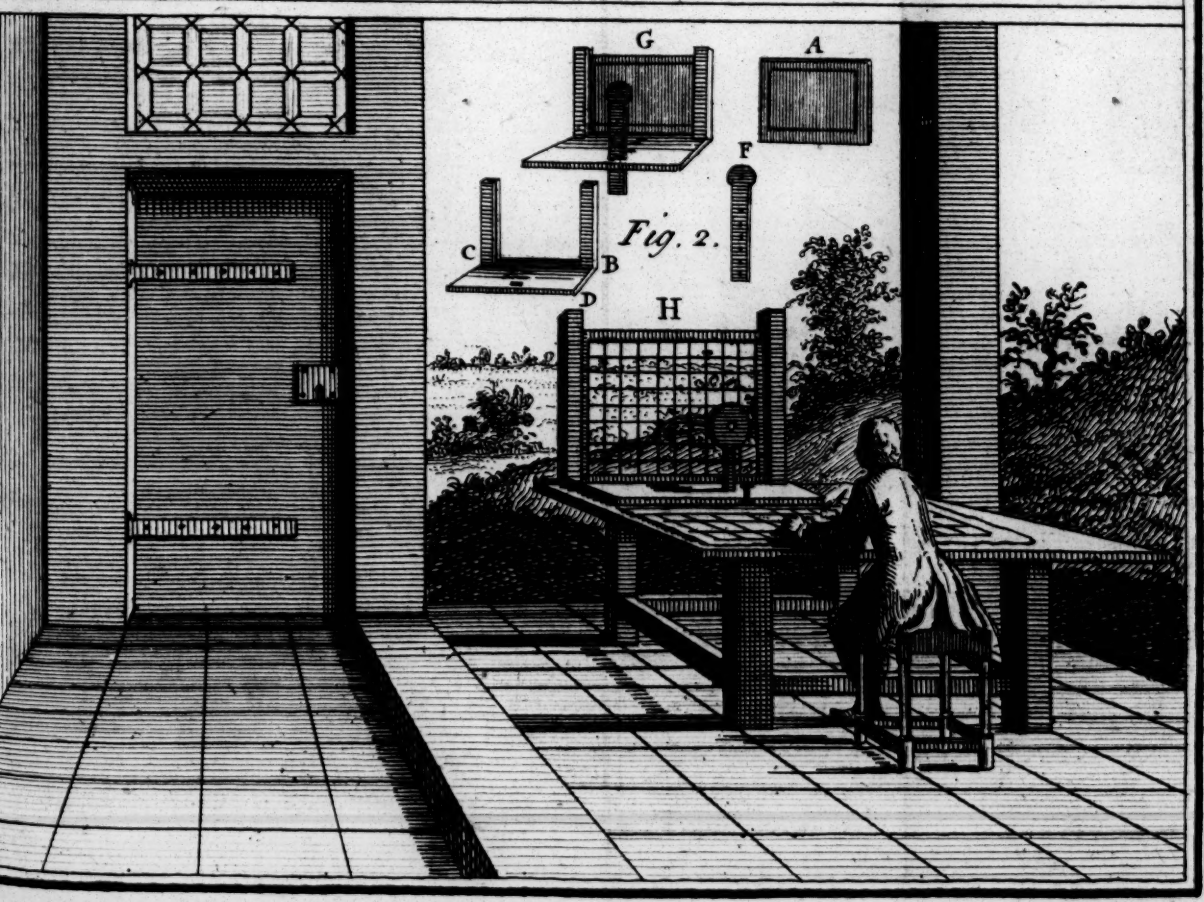
Short rules for DRAWING *in perſpective.* If we obſerve the faults daily committed in the deſigning of landſcapes, or Drawing views and proſpects, the knowledge of ſomething of perſpective, in order to correcting and avoiding ſuch errors, for the underſtanding that art, will render any one capable of Drawing any thing with mathematical truth and certainty.

It may reaſonably be believed, that ſo many miſtakes as are commonly made in Drawings, proceed from the apprehenſions that ſome have of the length of time it will take up to render themſelves maſters of perſpective, and by being frightened at the difficulties they conceive are in that ſtudy; imagining that is is abſolutely neceſſary that a perſon muſt be well grounded in the mathematics, before he can acquire a competent knowledge in perſpective.

The following leſſons therefore will be of uſe to remove this prejudice, and ſhew the method of Drawing in perſpective.

For the firſt leſſon of the plan. See plate XI, fig. 1. Suppoſe you have a ſquare piece of pavement, as in fig. 1, conſiſting of twenty-five pieces of marble, each a foot ſquare, it muſt be meaſured exactly, and laid regularly down upon paper; you may likewiſe, for your better obſervation, mark every other ſtone





Toms Sculp.

or marble black, which will better inform you how every particular ſquare will appear, when you have a true perſpective view of them; or elſe you may number every one, and, when the ſecond or following leſſon is done, number thoſe in the perſpective plan, with the ſame figures as are marked on the firſt plan.

Leſſon II, of laying the figure 1, in perſpective. See plate XI, fig. 2. It is to be underſtood in perſpective, that there are two points to be conſidered; the firſt is called the point of ſight, (ſee POINT *of ſight*) becauſe it relates to every thing in our view, from the place where we ſtand.

The other point is called the point of diſtance, becauſe it governs the diſtances, and the proportions of every thing we can truly ſee of the plan, in whatever poſition we happen to be. See POINT *of diſtance*.

At A you ſee the plan of figure 1; this is divided into ſquares, as mentioned in that figure, the three at the bottom marked B C D, in both, and the ſquares in the plan A, marked 1, 2, 3, 4, are thoſe which are marked in perſpective with the ſame numbers.

Now, to lay your plan in perſpective, fix your point of ſight, as you obſerve in the figure, more or leſs to the right or left as you think proper; then draw the line K K parallel to and at what diſtance you will from the line L L; draw a line from each ſide from L to K, to form the figure, as a frame to your picture; then draw a line from the corner K, which is the point of diſtance to L, and this line will regulate the work.

Then draw lines from the ſquares of the plan to the point of ſight, as exactly as poſſible; and wherever the line of diſtance cuts thoſe lines, which are drawn from the ſquares of the plan to the point of ſight, that marks where your ſquares in perſpective ought to be; then draw lines parallel to the line L L, where the line of diſtance cuts, and that will give you the true figure of every ſquare; ſo D in the perſpective plan anſwers to D in the meaſured plan, and 1, 2, 3, 4, anſwer to the others in the ſame.

When you have done this, the next requiſite is to know how to raiſe either pillars, trees, houſes, or any other bodies, according to their reſpective heights and different diſtances and proportion, on the plan you have laid down.

Leſſon III, plate XI, figure 3. How to raiſe pillars or any bodies of a certain proportion in perſpective. Your plan being now meaſured out in perſpective into ſquares of a foot, one of theſe ſquares in this leſſon ſerves for the baſe or bottom of a pillar a foot thick; the figure 3 in the plate is exactly of the ſame dimenſions of the plan laid in perſpective at figure 2.

Firſt mark the line L K (fig. 3.) in equal proportions, by the

ſame ſcale of the ground plan, figure 2, as *a b c d*, which are ſo many feet in height, and they, ſtanding on the baſe of the firſt figure, are upright, not in perſpective; then draw a line parallel with L I, from number 4, which gives you the front of the body you are to raiſe; and, if it is to be only three feet high, draw a line croſs from C to the line raiſed from number 4, and that determines the height, which you will then find to be a foot high by meaſure; then from the top of the line 4 draw a line, with a black lead pencil, to the point of ſight, and raiſe another line from 3 parallel to the line 4, till it touches the penciled line, paſſing from 4 to the point of ſight, which gives you the ſide appearance of the column or body, as you will ſee it in the place where you ſtand [the line from the point 3 ſhould be drawn with a pen, becauſe it is to remain] then with a pencil draw a line from C to the point of ſight, which will determine the other line, to make the ſhape of the top of the column; and then draw a line parallel with L K, with a pencil, from the point 2, till it touches the line from *c* to the point of ſight.

Then draw a parallel line to *c* 5 at 6, 7, and you will have the ſquare of the top of the pillar or column, as you can obſerve it from the place where you ſtand, which is ſuppoſed to be at A.

You muſt remember, that the line drawn from 2 to 6 is only an imaginary line, to be rubbed out; for it cannot be ſeen from the place of ſtanding, and therefore muſt not appear in the Drawing; but it ſhould not be left out, becauſe it ſhews you to regulate the top of the column.

DRYADES ſo called of Δρῦς Gr. an oak, as having their beginning with trees, and dying again with them.

They are repreſented as beautiful virgins; but not ſo fair as the Napeæ, but of a brown and tawny complexion, having their hair thick like moſs, and their habit of a dark green colour.

Gaſparo DUGHET, born in 1600, lived at Rome, and excelled in landſcapes; he died in the year 1663.



Albert DURER, born in the year 1471, ſcholar of his father and Michael Wolgemuth, lived at Nuremburg, excelled in hiſtory-painting, portraits, perſpective, and ſculpture; died in the year 1528, aged fifty-ſeven years. He uſed this mark, and A E in a very few plates.

John Burchinayr Auguſtano made uſe of the former mark; and Matthew Grunewald of Aſchaffemburg, who was cotemporary with Durer; as alſo Mark Anthony Raimondi, in the life of Chriſt, copied from that of Albert Durer, for which the latter accuſed him before the ſenate of Venice.

Braſs DUST. This is commonly called gold Duſt; the beſt, which comes from Germany, is that which is the brighteſt and moſt gold-like colour, which is to be perceived by taking a little

of

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Plate XI.

Fig. 1.

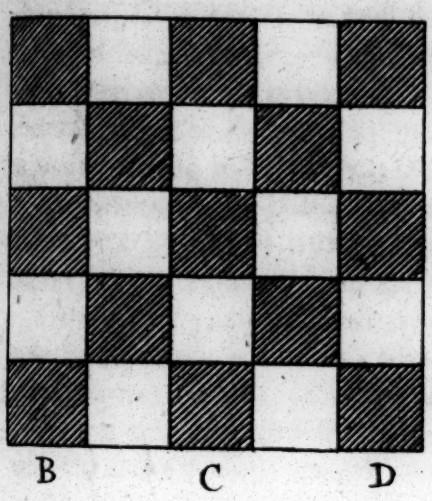


Fig. 2.

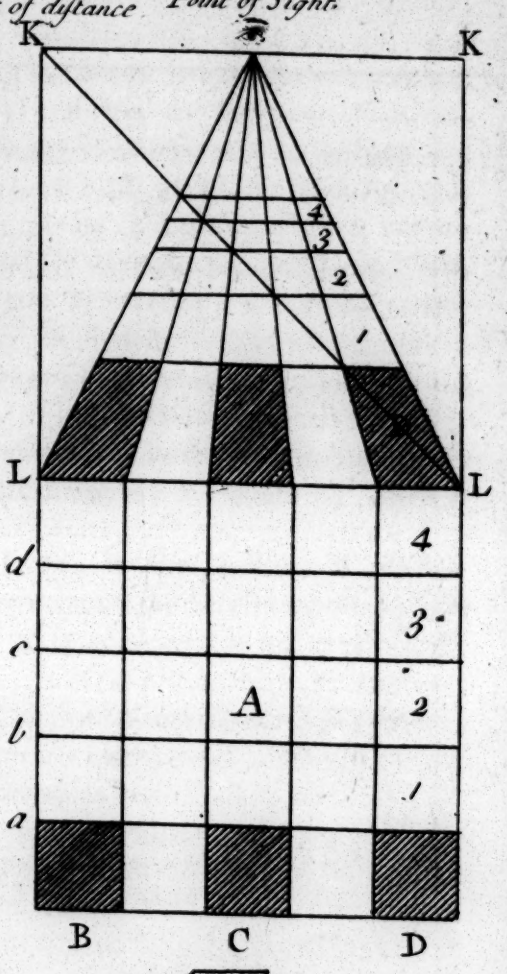


Fig. 3

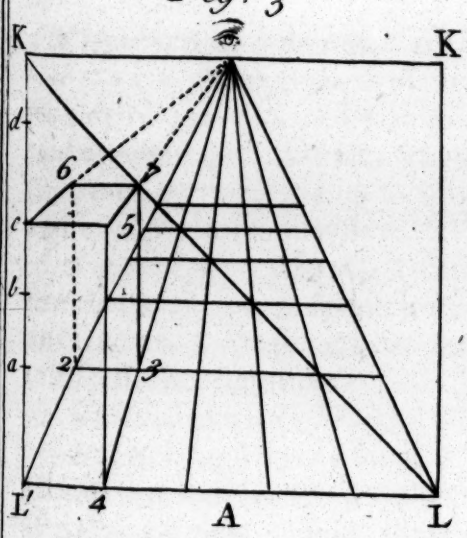
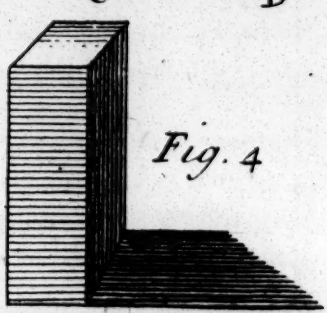


Fig. 4



of it between your finger and thumb, and rubbing them together; if it be good, it will be of a bright, rich, golden luſtre; if bad, it will be of a dull, clayiſh colour. The coarſer ſort works well with gold ſize, but not with gum water. It is of different prices, according to the goodneſs; the beſt is worth twelve or fourteen ſhillings the ounce, when, at the ſame time, ſome other ſorts are not worth above four or five ſhillings the ounce. The middle ſort, which is worth eight or nine ſhillings the ounce, will work well.

Silver DUST. The beſt of this comes from abroad, having a lively bright luſtre, like that of poliſhed or new coined ſilver, which is to be perceived by rubbing it between your finger and thumb; whereas the worſer ſort, which is made in England, is dull, dead, and heavy, more fit for a colour than a metal. The difference is eaſily perceived by comparing them together. The beſt is worth ſixteen ſhillings the ounce; the other counterfeit is not at all valuable.

Green gold DUST, is an adulterated or mixed metal, caſting a kind of dead, greeniſh colour, and is worth about ſix ſhillings the ounce. This, as alſo the following, are uſed in garments, flowers, houſes, and the like, making the work more beautiful and ſurpriſing.

Sullied or dirty-coloured Gold DUST, is alſo a kind of adulterated metal, bearing ſome reſemblance to droſſy gold. The price is ſix ſhillings the ounce, and is uſed for the ſame occaſions as the former.

Tin DUST *or powder*, is made of block tin ground to powder, and is of a dull, dark, but ſilveriſh colour; it is uſed in rocks, &c. and is ſold for ſix ſhillings the ounce.

Natural copper DUST, is made of copper ground, without mixture, to duſt. This is of the true natural colour of copper, and is ſold for ſix or ſeven ſhillings the ounce.

Artificial copper DUST. This exceeds the natural, and is more deep or reed; but very clear, and of a bright ſhining colour, and ſhews, how far art can outdo nature. It is ſold for about ten ſhillings the ounce.

Adulterated copper DUST, is of a thick, heavy, dull, metallic colour, and commonly uſed to work other metals on; for, being laid as a ground, you may hatch or heighten with bright gold, or other ſhining metal; it is ſold for about ſix ſhillings an ounce.

Sir *Anthony Van* DYKE, was born at Antwerp, anno 1599, and Rubens, his maſter, fearing he would become as univerſal as himſelf, to divert him from hiſtories, uſed to commend his talent in painting after the life, and he kept him continually employed in buſineſs of that nature, ſo that he reſolved at laſt to make it his principal ſtudy; and, for his improvement, went to

Venice, where he attained the beautiful colouring of Titian, Paulo Veroneſe, &c.

After a few years, ſpent at Rome, Genoa, and Sicily, he returned home to Flanders, with a manner of painting, ſo noble, natural, and eaſy, that Titian himſelf was hardly his ſuperior; and no other maſter in the world equal to him in portraits.

He came over to England ſoon after Rubens had left it, and was entertained in the ſervice of king Charles I, who conceived a great eſteem for his works, honoured him with knighthood, preſented him with his own picture ſet round with diamonds, aſſigned him a conſiderable penſion, ſat very often to him for his portrait, and was followed by moſt of the nobility and principal gentry of the kingdom.

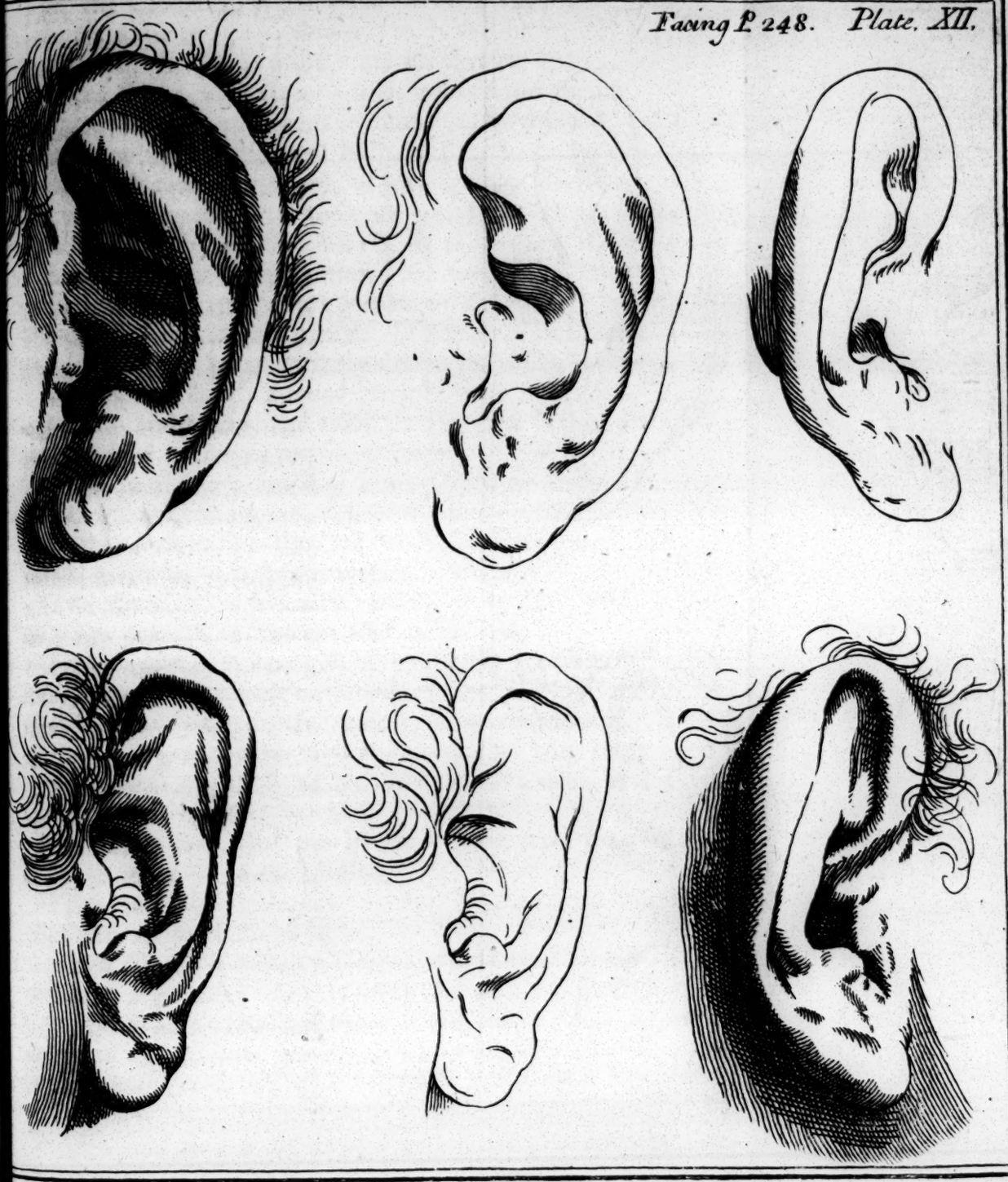
He married one of the moſt beautiful ladies in the Engliſh court, daughter to the lord Ruthen, earl of Gowry, and lived in grandeur anſwerable to her birth. His own dreſs was generally rich; his coaches and equipage magnificent; his retinue numerous and gallant; and his table very ſplendid, and ſo much frequented by people of the beſt quality, that his apartments rather ſeemed to be the court of a prince, than the lodgings of a painter. He, being deſirous of immortaliſing his name, went to Paris, in hopes of being employed in the grand gallery of the Louvre; but, not ſucceeding there, returned hither, and propoſed to the King, by his friend Sir Kenelm Digby, to make cartoons for the banqueting-houſe at Whitehall; the ſubject of which was to have been the inſtitution of the order of the Garter, the proceſſion of the knights in their habits, with the ceremony of their inſtalment, and St. George's feaſt. But, his demands of 80,000l. being thought unreaſonable, whilſt the king was treating with him for a leſs ſum, the gout and other diſtempers put an end to that affair and his life, anno 1641, being aged forty-two years, and his body was interred in St. Paul's church.

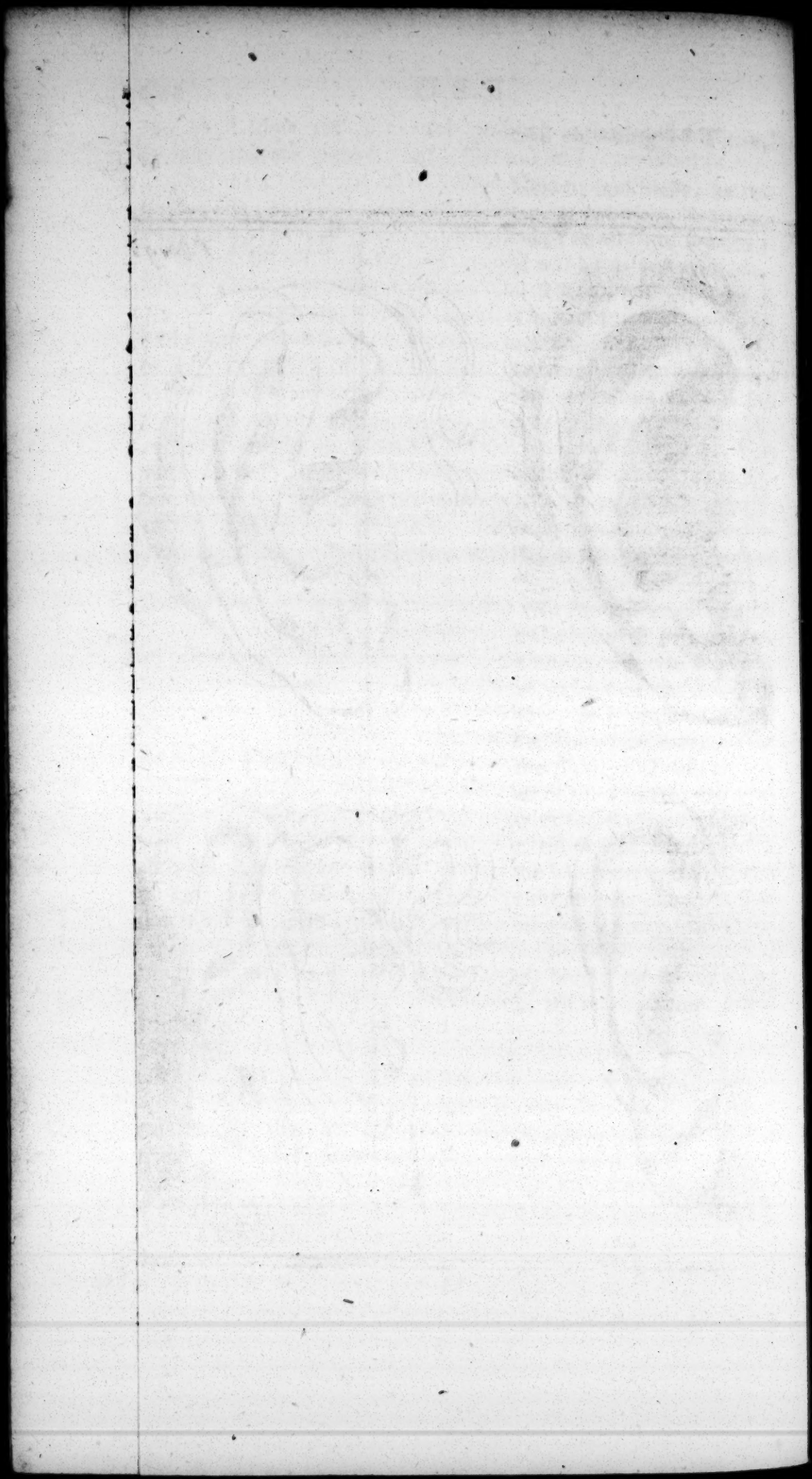
DYING, of cloth, ſtuff, ſilk, ſkins, bones, &c. See under the proper articles of the colours black, white, red, blue, green.

E.

EAR, *the organ of hearing.*— In delineating portraits the Ear is a principal part, and therefore all who practiſe drawing, ſhould know how to repreſent it; examples for drawing the external parts of this organ, which is all that is required in painting, are given on plate XII.

The EAST, is repreſented, in painting, by a pretty youth with golden locks, a ſplendid ſtar over his head, in a ſcarlet robe interwoven with pearl; his girdle is embroidered with Aries, Leo,





Leo, and Sagittarius, holding flowers in his right-hand juſt ready to bloſſom. The ſun riſen, the verdant, pleaſant plants, and birds warbling out their notes; in his left-hand a perfuming-pot.—Youth denotes that this is the infancy of time; the golden locks, the ſun-beams; the ſtar is Lucifer; the jewels, that they come from the eaſt; the flowers, that, the ſun-beams appearing in the eaſt, the fields ſmile, and the flowers open; the perfuming-pot ſhews, that ſweet odours come from thence.

EASEL, is an inſtrument or frame made of wood, much like a ladder, with flat ſides, and full of holes, to put in two pins to ſet the work higher or lower, at pleaſure, for the eaſe of the artiſt, whence doubtleſs it took its name; on the backſide of it there is a ſtay, by which it may be ſet more upright or ſtooping.

EASEL *Pieces*, with painters, are ſuch ſmall pieces, either portraits or landſcapes, as are pointed on the Eaſel, i. e. the frame whereon the canvaſs is ſtrained.—They are thus called to diſtinguiſh them from larger pictures drawn on walls, cielings, &c.

EBONY, a kind of wood brought from the Indies, exceedingly hard and heavy, and taking a very fine poliſh, and on that account uſed in moſaic and inlaid work.

There are divers kinds of Ebony; the moſt uſual among us are black, red, and green, all of them the product of the iſland of Madagaſcar, where they are called by the natives indifferently hazon mainthi, q. d. black wood.

The iſland of St. Maurice, belonging to the Dutch, likewiſe furniſhes part of the Ebonies uſed in Europe.

Authors and travellers give very different accounts of the black Ebony-tree. The moſt authentic of them is M. Flacourt, who reſided many years at Madagaſcar, as governor of it. He tells us the tree grows very high and large, its bark black, and its leaves reſembling thoſe of our myrtle, of a deep, duſky-green colour.

Tavernier ſays, that the iſlanders bury their trees when cut down to make them the blacker.

Pliny and Dioſcorides ſay, the beſt Ebony comes from Ethiopia, and the worſt from India.

Black Ebony is much preferred to that of other colours; the beſt is of a jet black, free of veins and rind, very maſſive.

It yields an agreeable perfume when laid on coals; it contains much of an unctuous quality, and thence eaſily takes fire, when burnt while green.

It is now much leſs uſed among us than it was formerly, ſince the diſcovery of ſo many ways of giving other hard woods a black colour.

As to green Ebony, beſides Madagaſcar and St. Maurice, it grows alſo in the Antilles, and eſpecially in the iſle of Tobago.

The

The tree that yields it is very bushy; its leaves smooth, and of a fine green colour.

Beneath its bark is a white rind about two inches thick; all beneath which, to the very heart, is a deep green, approaching towards a black, though sometimes streaked with yellow veins.

Its use is not confined to mosaic work; but it is likewise useful in dying, as yielding a fine green tincture.

As to red Ebony, also called grenadilla, we know little of it more than the name.

Cabinet-makers, inlayers, &c. make pear-tree and other woods pass for Ebony, by ebonising, or giving it the black colour of it.

This is done, by some, by a few washes of a hot decoction of galls, and, when dried, by adding writing-ink on it, and polishing it with a stiff brush and hot wax.

Gerard EDEMA, was a landscape-painter, born at Amsterdam, and disciple of Everdine, whose manner he at first followed. He came over into England in the year 1670, and became very famous for landscapes; his manner was afterwards broad and bold, in imitation of some Italian pictures. His pictures commonly afford a scene of clifts, cascades, and views, as the learned Dr. Burnet in his Theory calls it, of a broken world; he chose a country uncultivated, full of rocks and falls of water, the latter of which he never failed to express well, dispersing a gentle warmth throughout the whole, to make amends for the horror of the prospect which generally represents Norway or Newfound-land, places in which he studied as Everdine, his master, did before him; after whom there are extant many prints, expressing a country wild and rude. Mr. Edema died in Surrey, about the year 1700, in the 40th year of his age.

EDUCATION, is represented, in painting, by a lady at full age, cloathed in a cloth of gold; a ray, shining upon her, shews her turgid breast; holding a rod in one hand, seeming to teach a child to read; on her left side a pale fixed in the ground, with a tender young plant tied thereto, which she embraces with her right arm. The ray signifies, that the grace of God is necessary, and that God gives the increase; the breasts denote the principal parts of Education, to teach candidly, and to communicate; the rod, correction; the tender plant, her endeavour to direct and set straight, and to teach good manners.

ELEGANCE, of painting, is not founded on the correctness of the design, as appears in Raphael and the antique. It is most sensibly perceived in works otherwise careless and inaccurate; as in Correggio, where, notwithstanding all the defects as to justness of design, there is an Elegance even in the manner of the design itself, as well as in the turn of the attitudes, &c.— The Elegance

gance of a deſign is a manner of being, which embelliſhes and heightens objects, either as to their form or colour, or both, without deſtroying or perverting the truth.

To make the four ELEMENTS *appear in a glaſs.* Take jet in fine powder, an ounce and an half; oil of tartar per deliquium, made without any addition of water, two ounces, coloured of a light green with verdigreaſe; add thereto ſpirit of wine tinged with a light blue, with two ounces of indigo; of the beſt rectified ſpirit of turpentine, tinged of a light red, with two ounces of madder; mix all theſe in a glaſs, and ſhake them together, and you will ſee the heavy black jet fall to the bottom, and repreſent the earth. Next the oil of tartar made green-falls, repreſenting the water: Upon that ſwims the blue ſpirit of wine, repreſenting the air or ſky; and uppermoſt of all ſwims the red oil of turpentine, repreſenting the Element of fire.

It is ſtrange to ſee, how, after ſhaking all theſe together, they will be diſtinctly ſeparated one from another.

ELEMI, } as gum Elemi, is a pellucid reſin of a whitiſh co-
ELEMY, } lour, intermixed with yellowiſh particles, which give it much the colour and conſiſtence of wax.

It is called gum Elemi, but improperly, inaſmuch as it takes fire readily enough, and diſſolves in liquors of an oily quality, which are the characters of roſin.

It flows from inciſions made in the trunk and large branches of a kind of olive-tree, growing in Ethiopia and Arabia Felix. It is alſo found in the Pouille, a province of the kingdom of Naples.

Pomet and Lemery, in their treatiſe of drugs, deſcribe Elemi as a white roſin, bordering on green, odoriferous, and brought from Ethiopia, in cakes of two or three pounds a piece, wrapped up in the leaves of the Indian cane.

The true gum Elemi is that above deſcribed; but there are ſeveral ſpurious ones, ſome natural, and others factitious, frequently ſold for the ſame.

The factitious or counterfeit is made of roſin, waſhed with oil of aſpic; though the ill ſmell and white colour might eaſily diſcover the deceit.

AAE *Adam* ELSHEIMER, who worked with Peter Bruguel, engraved his plates with this mark, was born in the year 1574, diſciple of Philip Uffenback, ſtudied at Rome, excelled in hiſtory, landſcape, and night pieces; died in the year 1610, aged thirty-ſix years.

EMBOSSING } is the act of forming or faſhioning works in
IMBOSSING } relievo, whether they be caſt or moulded, or cut with a chiſſel.

Emboſſing is one great part of ſculpture, being that which has to do with figures raiſed or prominent from the plain or ground.

ground. The other part which makes figures that are indented or cut in below the ground, is called Engraving.

Raiſed and EMBOSSED *Work.*

1. You muſt firſt make the model of your deſign, and that is to be done with clay.

Take good, tough, well tempered clay, and model it with proper tools, and work out any ſort of carving or emboſſment, as your fancy leads you; then lay it aſide to dry in the ſhade, for either ſun or fire will crack it.

2. When it is grown perfectly dry and hard, and you purpoſe to caſt the moulds on the models, oil your models very well with linſeed oil; and, having wrought the paſte extremely well between your hands, clap it on and preſs it down cloſe everywhere, that it may be a perfect mould in all parts, which, when it is dry, is finiſhed.

To make the paſte for making moulds. Make a glue-water ſtronger than any ſize, yet not quite ſo ſtrong as joiners melted glue; mix with it whiting finely powdered, of as thick a conſiſtence as paſte and dough; knead it very well, wrapping it up in a double cloth, that it may lie in it and get heat from the fire, for you muſt not let it grow cold; for, if ſo, it will harden, and be rendered unfit for uſe.

To make the mould of any carved frame, thereby to imitate it in paſte. Take ſome of the before-mentioned paſte, according to the length and largeneſs of the leaves and flowers you would take off; you need not take off a whole length, for probably there may be the ſame thing ſeveral times over on one ſide, ſo that one mould may ſerve all of that ſort, they being well united or joined together.

Work the paſte between your hands, and clap it in that part of the frame you intend to take a mould off.

Let there be ſo much of the paſte as ſhall ſuffice to make the back of the mould flat and even, and, while the mould is warm, take it from the frame, and the ſame inſtant fix it to a board, which is larger than itſelf.

After this manner you may take off any ſort of Emboſſed work or carving from any part of your frame; all which moulds may be glued on little boards, and ſo ſet by to dry and harden.

To place the paſte on frames. The frames are to be made by a joiner, which being ready, and alſo the paſte and moulds, theſe laſt muſt be very well oiled with linſeed oil, ſtriking the bruſh into every little crevice and corner, to prevent the moulds from ſticking to the paſte.

Then take a quantity of the warm paſte, ſufficient to fill up the moulds, and, it being well worked between your hands while it is warm and in good temper, apply it to the mould, preſſing all

parts

parts of it with your thumbs and fingers; and then, with a knife, cut off the ſuperfluous paſte even with the top of the mould.

Then turn out this new-faſhioned Emboſſed or carved work on your hand, and bruſh it over with thin glue before it is cold, and alſo the place it is deſigned for, and immediately put it upon your frame, in the ſame place where it muſt always remain, preſſing it gently down.

Then oil your mould again, and with freſh paſte make more emboſſments or carved works in like manner, which caſt off and place on your frame as before; repeat this ſo often till your whole frame is filled with theſe emboſſments.

Let it ſtand to dry for five or ſix days, or a week; and then you may venture to lay your white ground on it, upon which you may paint, varniſh, gild in oil, or burniſh, as you pleaſe.

Another way to make raiſed or EMBOSSED *works.*

1. Make a ſtrong gum arabic water, take whiting, fine bole, of each one ounce; grind theſe with a ſufficient quantity of the gum water, till they are as fine and ſoft as butter, and ſo thin that, if a pointed ſtick be dipped into it, the mixture will juſt drop from it; if it proves too thick, you may thin it with gum water; and, if it be too thin, it may be thickened with whiting and bole.

2. Dip this pointed or taper ſtick into this mixture, and drop on the rock-houſe-tree, flower, or fruit, what you would rinſe or emboſs; repeating the dropping of this mixture ſo often, till the work is raiſed as bold or as high as you would have it.

3. Sometimes you will find your paſte to bladder or ſwell; this is cauſed by an inſufficient grinding of the whiting and bole with gum water.

Theſe bladders, if they are not prevented or removed, will cauſe the work when dry to be full of holes, and will ſpoil its beauty.

To cure this, when it is dry, take a fine rag, and with your finger rub it over and over again, till the holes and cracks are ſtopped up; and, when it is dry, ruſh it well till it is very ſmooth.

4. In the japan that is raiſed for garments, rocks, &c. ſome parts are elevated and higher than others; as, in plaits and foldings of garments, thoſe which ſeem to lie underneath, are always at the greater diſtance.

In flowers, thoſe which are firſt and neareſt the eye are higheſt, and thoſe leaves which lie firſt are higher than thoſe which lie behind them.

So, in rocks, the firſt and neareſt muſt always be raiſed higher, and ſwell beyond that which is almoſt hidden or ſeems to lie behind.

5. This rule holds in all things of like quality, and therefore

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the deſigh muſt be raiſed, according to nature; to its due height, whether figure, tree, houſe, flower, fruit, or landſcape; and, being well dried with a little gum water, vermilion, and a pencil, you muſt trace out the lines for the face, hands, foldings of garments, leaves of plants, ſeeds of flowers, fruits, houſes, trees, rocks, &c. in their proper ſhape, according to thoſe lines, which were drawn as boundaries, for laying the paſte in its proper figures.

6. You muſt be provided with ſeveral inſtruments; as, firſt, a bending graver, ſuch as is uſed by engravers; ſecondly, ſeveral ſmall chiſſels, the broadeſt not exceeding a quarter of an inch; all the other proportionably leſs.

7. With theſe you muſt cut, carve, clear, and ſcrape your raiſed or Emboſſed works in height, ſhape, and proportion to your pattern, or what is agreeable to nature and the deſign.

Theſe inſtruments muſt be exquiſitely ſharp, and your hand very exact, eaſy, and gentle, leſt you ſhould break off the work in any place, and ſpoil the piece; laſtly, ſmooth it with a bruſh that has been often uſed before to make it fit for painting, varniſhing, japanning, or gilding.

Another way to perform thoſe raiſed or EMBOSSED *Works.*

1. Strike or trace out the deſign, as well the inſide as the outſide of faces, necks, hands, legs, the chief ſtrokes of the foldings of garments, leaves of plants, flowers, ſeeds, fruits, houſes, trees, rocks, birds, beaſts, &c.

2. Take the paſte before mentioned, but ſomething thinner, and with it raiſe the lower parts of all, or any of the particulars before-named, which require the leaſt height or raiſing, and let it dry thoroughly.

3. Then take the thickeſt ſeed lack-varniſh, and, with a very ſmall or fine pencil dipped in it, varniſh juſt the edges of your raiſed work, becauſe that, as you raiſe the other parts of the work higher, it may hinder the freſh wet paſte from incorporating with the dry, which would make the work look ill.

4. This work of varniſhing the edges muſt be done as often as one part is raiſed above another; and ſtill, as the work grows higher, the paſte muſt be made thicker, and each part raiſed in order, beginning with the loweſt, and ending with the higheſt.

5. When all is dry, if need requires, it muſt be ſmoothed with a ruſh, to make it fit to receive the colours and metals, or what elſe you are pleaſed to put upon it.

6. Mix your metalline colours with gum water, and lay them on the emboſſments, and places where they ought to lie; and, when they are thoroughly dry, burniſh them with a burniſher, till it is bright and ſhines with a good luſtre.

7. Having done this, go over all your emboſſments with a fine

fine ſeed lack-varniſh, and a proper pencil, twice or thrice, and then ſet it off or ſhadow it at diſcretion.

8. You ought not to make any more of this paſte than you can uſe at once, that it may not dry before you uſe it again; for, if it be dry, you muſt grind it again, and then it will be as fit as before.

Nor ought it to be made too weak; and, if it be, it muſt be ſtrengthened with more gum water, which you may fully find out at length by many trials and experiments.

And you will find it is poſſible to make a paſte ſo ſtiff and tough, that a violent blow with a hammer ſhall hardly break or bruiſe it.

To ſet off raiſed or EMBOSSED *Work with black.*

1. Having varniſhed and burniſhed your work with lamp-black, mixed with a little gum water, hardly enough to wet it, and incorporated with a bruſh-pencil with ſo much fair water added to it, as, with a ſmall well pointed pencil, will make it to run in fine black ſtrokes, draw the lineaments and features of the faces, foldage of garments, veins of leaves, flowers, and ſeeds, with the black hatchments of your flowers, bodies of trees, &c.

2. And, if you would ſpeckle any rocks, firſt paſs them over with the ſaid black; and, when they are dry, give them two waſhes with the ſecuring varniſh, and then lay on the ſpeckles.

But if the places deſigned to be ſpeckled ſhould be too ſlippery, ſo that there is danger of their ſliding off, in this caſe the greaſy kind of ſlipperineſs muſt be taken away by rubbing the places gently with a ſoft tripoli cloth.

3. This way of ſetting off is more in uſe, than that of a tracing pencil or breathing on it; not only for raiſed or Emboſſed work, but the flat work too: For, your piece being dry, ſtrake it once over with the ſecuring varniſh; and then hatch and vein it at pleaſure with a black lead pencil, and do the ſame with other metals and colours beſides gold.

4. For inſtance; if a red flower is to be ſet off with ſilver, firſt ſecure the red with varniſh; and, when that is dry, hatch and vein it with ſilver; this rule is to be obſerved in all caſes, where one thing is to be wrought upon another, whether colour upon metal, or metal upon colour; or metal ſometimes upon metal.

5. The work being thus adorned and ſet off, if the work be flat or plain, make uſe of white poliſhing varniſh to ſecure it, both as to draught and ground work, which will endure a poliſhing.

6. But, if the work be Emboſſed or raiſed, then the ſecuring varniſh is to be uſed, becauſe Emboſſed work will not bear a poliſhing,

liſhing, as the flat work will; but muſt only be ſecured and cleared up.

But the laſt named varniſh may be uſed either for flat or Emboſſed work, whereas the former is only fit for flat work.

7. If you work in gum water, you muſt take care that it be not too ſtiff of the gum; if ſo, it will ſpoil the beauty and luſtre of the metalline colours; but it may eaſily be weakened with fair water; if it be too ſtiff, you ſhould only make it juſt ſtiff enough with gum, as may make them ſtick cloſe to the work, and endure varniſhing without coming off.

The way of performing rock work. 1. Theſe, as has been ſaid, are to be done laſt of all, becauſe they cannot be well finiſhed till the reſt are compleated, except only ſome few ſcattered plants, ſuppoſed to grow upon them, that they may not appear naked; nor, yet, muſt there be too many of them neither, leſt their number ſhould interrupt the ſhadow and confound the ſight.

2. If theſe rocks are to be covered with metalline colours, then lay gold, ſilver, or copper with your pencil, in a full body round the outward ſtreaks, that were traced with the pencil, in breadth about a quarter of an inch; but be ſure that it be not too wet.

3. Then cut off the point of a large gooſe-quill pencil, to make it flat and blunt at the end, and with that touch or dub your metal; and, after that, do the like to the black or brown part of the rock, that ſo it may be ſtrewed with ſome of the metal too, and continue it by little and little till the whole is ſtrewed over; but theſe ſpeckles ſhould be thicker towards the ſides and tops, than in or near the middle.

4. Other metals, artificial and adulterate, may be laid on according to theſe directions.

EMERALD, is a precious ſtone, very green and tranſparent, and the next in hardneſs to the ruby.

Pliny reckons up twelve kinds of Emeralds, and denominates each from the provinces or kingdoms where he ſuppoſed them to be found, as Bactrian, Scythian, Egyptian, Perſian, &c.

But the modern jewellers diſtinguiſh them but into two kinds, viz. the oriental and Peruvian.

Though Tavernier denies, that there is or ever was any mine of Emeralds in the Eaſt-Indies, and that all that are found there are brought thither from Peru by the way of the South Sea; which was a method of commerce carried on by the inhabitants of Peru, before the diſcovery of America by the Spaniards; yet, this commerce not being fully proved, we ſhall keep to the diſtinction of oriental and Peruvian.

The oriental Emerald is harder, more brilliant, and tranſparent

tent than the Peruvian, which has generally clouds found in it, and ſparkles leſs.

And, beſides, there are ſuch quantities brought from Peru by the way of Carthagena, that the value and reputation of them is much ſunk.

The Emerald is ſuppoſed to grow more and more perfect in the mine like the ruby, and to arrive at its greenneſs by ſlow degrees.

It is a common opinion that the Emerald grows in the jaſper, and it is certain there are ſome jaſpers ſo perfectly green, that they have, by many, been taken for Emeralds.

The proper matrix or marcaſite of this ſtone is the preme, which is reckoned among the coarſer precious ſtones; being hard, tranſparent, half opapue, and uſually intermixed with yellow, white, green, blue, &c.

Some authors make mention of ſeveral Emeralds of incredible magnitude; as a table which king Tarik had for his ſhare of the plunder of Toledo, a table three hundred ſixty-five feet long, and all of a piece, which was an Emerald. And Theophraſtus relates, that he had ſeen in a temple in Egypt one of four cubits long, and three broad; and, alſo, ſome mention an obeliſk of Emerald forty feet high.

Some authors are of opinion, that Emeralds are taken out of iron mines. And Pomet aſſerts, that he had one to which the iron ore was ſtill ſticking.

Some tell us of Emeralds found in Cyprus, and even in Great Britain; but, if there are of them any true ones at all, they are not conſiderable.

In M. Savary's Dictionary de Commerce, there is the following accurate eſtimate of the values of the different kinds of Peruvian Emeralds, as follows:

Rough EMERALDS. Thoſe of the firſt and coarſeſt ſort, called plaſmes for grinding, are worth twenty-ſeven ſhillings ſterling the mark, or eight ounces.

The demi-morillons, eight pounds ſterling per mark.

Good morillons, which are only little pieces, but of fine colour, from thirteen to fifteen pounds per mark.

Emeralds larger than morillons, and called of the third colour or ſort, are valued at, from fifty to ſixty pounds per mark.

Emeralds, called of the ſecond ſort, which are in larger and finer pieces than the preceding, are worth from ſixty-five to ſeventy-five pounds per mark.

Laſtly, thoſe of the firſt colour, otherwiſe called negres cartes, are worth from a hundred and ten to a hundred and fifteen pounds per mark.

Emeralds ready cut or poliſhed, and not cut, being of good ſtone and a fine colour, are worth:

	l.	s.
Thoſe weighing one carat or four grains ——	00	10
Thoſe of two carats —— ——	1	7
Thoſe of three carats —— ——	2	5
Thoſe of four carats —— ——	3	10
Thoſe of five carats —— —— ——	4	10
Thoſe of ſix carats —— ——	7	10
Thoſe of ſeven carats —— ——	15	00
Thoſe of eight carats —— —— ——	19	00
Thoſe of nine carats —— ——	23	00
Thoſe of ten carats —— —— ——	33	00

Counterfeit EMERALD. The manner of making counterfeit Emerald in paſte is this: Take cryſtal prepared, two ounces; common minium, or red lead, four ounces; mix theſe well together; then add, of good verdigreaſe, two pennyweights, and crocus martis, made with vinegar, eight grains. Mix all theſe well together, and ſet the whole in the hotteſt part of a potter's furnace as long as the fire laſts. It muſt be put into a ſtrong crucible, and covered with a lute; when it is cold, take off the lute, and, if it is baked enough, it will be clear to the bottom; otherwiſe relute the pot, and put it into the furnace again. Twenty-four hours, commonly, is ſufficient for the making this; ſometimes it requires a little more. The paſte thus made is harder than ordinary, and is of a fine colour and capable of a good poliſh. *Neri's Art of Glaſs*, p. 128.

If the paſte be deſired of a very deep Emerald colour, take prepared cryſtal, one ounce; red lead, ſix ounces and an half; of verdigreaſe, three pennyweights and thirteen grains; and of crocus martis, made with vinegar, ten grains; this requires a longer baking than the other, and is leſs hard, though of a deeper colour. *Neri*, p. 129.

The proportions of theſe ingredients may be varied at pleaſure, and the colour be made of all degrees of deepneſs; but, the more lead is added, the more baking is required, and, after all, the paſte will be ſo much the ſofter.

EMERALD *Colour, in the glaſs trade.* The way of giving this beautiful dye to glaſs is this: In the pots of melted metal, made of pulverine, and without manganeſe, when the matter is well purified, put a little crocus martis calcined with vinegar; about three ounces of this crocus is enough for a 100 weight of glaſs. Let it ſtand till thoroughly mixed, then put, into every 100 weight of metal, two pounds of calcined braſs; this muſt be added at different times, letting the metal ſtand two hours every time.

When

When this is all in, make a proof of the metal, and, if it have any bluiſhneſs, add more crocus martis, a ſmall quantity at a time. When the whole is of a fine leek-green, let it ſtand twenty-four hours to mix thoroughly, and then work it. *Neri's Art of Glaſs*, p. 51.

When it is grown cold, break the crucible, and you will find within a matter of the colour of a very find Emerald; which, if ſet in gold, will ſurpaſs, in beauty, the true oriental Emerald.

If it happens that your matter is not enough refined and purified, you muſt ſet it in again the ſecond time into the ſame furnace, where it will be purified as much as it need to be; which may be known by lifting up the cover, if the matter appears ſhining.

If it is not ſo, lute the cover on again, and put the whole into the furnace.

You may obſerve this once for all, that you muſt not break the crucible before the matter is thoroughly baked and purified; for, if you do, and ſo are obliged to put the matter into another crucible, the paſte will be painted and full of bliſters.

If you cannot eaſily have the conveniency of uſing a potter's furnace, you may make one yourſelf with a little charge, wherein you may put twenty crucibles at once, each of different colours; ſo one baking may ſerve for a great deal of matter.

You muſt make uſe of hard wood to dry and heat the furnace, as is alſo directed in the baking of glaſs, and continue the fire twenty-four hours, in which time the matters ought to be baked and purified enough; but, for more ſurety, you may continue the fire ſix hours longer, and they will be certainly baked enough.

The matter being thus rightly baked, you may have it poliſhed at the wheel, and ſet it in a foil in gold, as is done with true gems, and you will have an Emerald brighter than the oriental.

Another deeper EMERALD *Colour.* That which makes Emerald deeper than the precedent, proceeds from the ſmaller quantity of cryſtal employed in it, with more of the other materials, which make it indeed more fair, but at the ſame time more brittle.

You muſt bake it at leaſt ſix hours longer than the preceding, to take away that imperfection, which lead uſually gives.

The doſe of this paſte is, one ounce of natural cryſtal prepared, ſix ounces and an half of red lead, ſeventy-five grains of verdigreaſe, ten grains of crocus martis made with vinegar; the whole pulveriſed and well mixed together. Then proceed as directed in the article preceding; only let the matter ſtand longer in the fire, and you will have an admirable oriental Emerald co-

lour, which, being ſet in gold with a foil of the ſame metal underneath, will be inexpreſſibly fair.

Another way to make a fairer paſte for EMERALDS. This paſte will be as brittle as the preceding for the reaſons before given; for you muſt take ſeven ounces of minium to two ounces of natural cryſtal prepared; to which add full eighteen grains of verdigreaſe, and ten grains of crocus martis; the whole pulveriſed and well mixed.

Then proceed as directed before, and you will have an Emerald fit for all ſmall works; but not ſo hard as the former, by reaſon of the great quantity of lead in it. Therefore it ought to be kept longer in the fire, that the pale colour of the lead may vaniſh.

Another fairer paſte for EMERALDS. The colour of this paſte will ſurpaſs the others in beauty, if there be care taken in the operation.

Take two ounces of natural cryſtal prepared, ſix ounces of minium in powder, and eight grains of verdigreaſe alſo in powder; mix the whole well together; then put them into a large crucible, covered and well luted, and ſet it in the furnace, as before directed, and do all as directed in the firſt article, and you will have an extraordinary fair Emerald colour.

Another very fair EMERALD *colour.* This ſtone will be far harder and finer than the preceding.

To make it, take four ounces of natural cryſtal prepared, a quarter of an ounce of red lead, and the ſame quantity of verdigreaſe; pulveriſe the whole, and ſift it fine; put them together into a crucible well cloſed and luted in the furnace, as before directed, letting it ſtand there for thirty-ſix hours.

After which, if you will, you may caſt your melted matter into a marble mould heated, putting it near the fire to cool gently, and you will have a very fine Emerald.

Another way of making a fair EMERALD. Take two ounces of cryſtal, add to it forty-eight grains of crocus martis, and two ounces and forty-eight grains of pure ſalt of tartar prepared; the whole reduced into fine powder in a braſs mortar; put theſe into a crucible covered with another, lute them well together; then ſet it into a glaſs-houſe fire, and bake it for twenty-four hours, and then in the annealing furnace for twelve hours, that the matter may cool by little and little, which then take out of the crucible, and you may cut and poliſh, and you will have a perfect Emerald.

Another oriental EMERALD. Take ten ounces of the prepared matter called SATURNUS *glorificatus*, which ſee; natural cryſtal, half an ounce; half an ounce of prepared verdigreaſe; half a drachm of feretto of Spain alſo prepared; reduce all into fine powder; mix them well together; put them into a crucible covered

vered with another; lute it, and let it dry; then ſet it in a glaſs-houſe furnace for three days, and afterwards in the annealing furnace for twelve hours. Then break the crucible, and you will find the matter tinged of a very fine oriental Emerald colour, which cut and poliſh.

EMERIL } a ſort of metallic ſtone, found in moſt or all
EMERY } mines of metal, but principally in thoſe of iron, copper, and gold.

There are of it three kinds; the Spaniſh, red, and common Emery.

The Spaniſh is found in the gold mines of Peru, and other provinces of Spaniſh America.

It is accounted a ſort of marcaſite of gold, being ſtreaked with little veins and ſpecks of it.

But this ſort is very rare among us, the king of Spain prohibiting the exportation of it.

The red Emery is found in copper mines; what we have of it comes from Sweden and Denmark.

The common Emery is found in iron mines, and is what is moſtly uſed in England.

It is uſed by various artificers in poliſhing and burniſhing iron and ſteel works, marble, cutting and ſcalloping glaſs, &c.

This Emery is of a browniſh colour, bordering a little on the red, exceedingly hard, and of conſequence very difficult to be reduced to a powder.

The Engliſh are ſaid to be the only people who have got the art of pulveriſing it, which is done chiefly by means of certain mills contrived for that purpoſe, and thus ſend it in powder to their neighbours.

It would be in vain to pound it in mortars, it being ſo hard that it would pierce or break the mortar, before it would give way.

The ſtone ſhould be choſe of a high colour and as rough as poſſible.

EMPEDOCLES, is painted in violet, murrey, or purple, and ſo are generally the reſt of the Grecian philoſophers.

ENAMEL, vulgarly called *Amel*, is a kind of coloured glaſs, uſed in painting in Enamel.

The baſis of Enamel is the fineſt cryſtal glaſs, made of the beſt kali from Alicant, and ſand vitrified together.

To this glaſs are added tin and lead in equal quantities calcined by a reverberatory fire.

To this fundamental compoſition of Enamel are added other metallic or mineral matters, to give it the various colours required, as crocus martis for yellow, æs uſtum for green.

Enamel may be diſtinguiſhed into three kinds,

The firſt intended for the counterfeiting and imitating precious ſtones.

The ſecond is for painting in Enamel.

The third is uſed by the enamellers, jewellers, and goldſmiths on gold, ſilver, and other metals.

The Enamel uſed in imitating precious ſtones, and alſo that for painting, is uſually prepared by the workmen themſelves, who are employed in thoſe arts. The reſt comes to us either from Venice or Holland; and particularly the white is that by which the makers of the Dutch ware give the luſtre and poliſh to their works.

The compoſition is the ſame in the main in all the three kinds; the difference conſiſts only in giving it the colour and tranſparency.

ENAMELS *for painting*. The white Enamel, uſed by painters in Enamel, is the ſame with the common Enamel uſed by enamellers; except that it is to be prepared by grinding and cleanſing it with aqua-fortis.

Then it is waſhed in fair water, pounded or ground over again in a mortar made of flint or agate.

The black is made of perigueux well calcined, and ground with oil of aſpic; having an equal quantity of the enamellers or goldſmiths black added to it.

The ruddy brown is made with fæces of vitriol and ſalt-petre, or with the ruſt of iron, well ground on an agate with oil of aſpic.

The yellow Enamel is the ſame with the goldſmiths Enamel, the compoſition of which you will ſee hereafter.

Vermilion red is made with vitriol calcined between two crucibles luted together; afterwards firſt waſhed in aqua-fortis, and then in fair water; the fire muſt be moderate for about half an hour.

Lake red is compoſed of fine gold diſſolved in aqua regia, with ſal armoniac or common ſalt; when the diſſolution has been compleated, it is to be put into a cucurbit, with ſpring water and mercury in a ſand-heat for twenty-four hours. Then the powder which remains at the bottom of the cucurbit, after the water has been poured off, is to be ground up with double its weight of flower of ſulphur, put into a crucible and ſet over a gentle fire. And, after the ſulphur which takes fire is exhaled, the red powder which remains is to be ground up with rocaille.

Blue is made of the azure or lapis, uſed by oil-painters, well purified and prepared with brandy, and ſet for five or ſix days in a bottle expoſed to the ſun's rays.

An amber colour is made by white copperas calcined. Theſe ſeven or eight colours or Enamels ſerve for compounding all the reſt; as blue and yellow make green, and ſo of other colours.

Jewellers, goldſmiths, and enamellers ENAMELS. Theſe are brought

brought to us chiefly from Venice or Holland in little thin cakes of different ſizes, commonly about four inches diameter, having the mark of the maker ſtruck on it with a puncheon.

The marks which are the moſt uſual, are the ſun, a ſyren, a monkey, or the name of Jeſus, &c.

Thoſe which come from Venice, are chiefly white, carnation, yellow, ſlate colour, ſky blue, green, and a deep blue called a falſe lapis.

Theſe ſeven colours are the principals of all the others; which ariſe out of the mixture of theſe, and the white, in particular, is as it were the ground of all the other ſix principal colours.

The white, as has been ſaid, is made of cryſtal glaſs and lead calcined by a reverberatory fire. This becomes a ſky blue by adding copper and Cyprus vitriol; a green by adding filings of copper, &c. a yellow by adding the ruſt of iron; a fleſh colour by adding perigueux; and a ſlate colour by adding azures.

ENAMELLING, is a method of painting with Enamels, or metal colours, ground, reduced to powder, and uſed with a pencil like other colours; then fuſed, baked again, and vitrified by force of fire.

This art is very ancient, and ſeems to have been firſt practiſed on earthen or potter's ware.

Hiſtory makes mention of beautiful vaſes, enamelled with various figures, made as early as in the age of Porſenna king of Tuſcany.

It is true, theſe came far ſhort, in beauty, to thoſe afterwards made at Faenza, and Caſtle Durante in the Dutchy of Urbino, in the time of Raphael and Michael Angelo.

Some of theſe vaſes are ſtill to be ſeen in the cabinets of the curious; the deſign or drawing of the figures of all which are much ſuperior to the colouring; they of thoſe times being unacquainted with the art of making any more than two colours, viz. black and white, either for earthen or metal works; excepting a faint kind of carnation in the faces and other fleſhy parts.

The art was retrieved in France in the time of Francis I, and particularly at Limoges; where many valuable pieces were wrought, after the manner of the ancients, i. e. performed well as to the drawing, and clair-obſcure, chiefly in two colours.

There are two ways of painting in Enamel; the one with clear and tranſparent, and the other with thick and opaque, colours.

To make the firſt fit for uſe, they are only to be ground up with water, and for the ſecond with oil of aſpic.

The firſt are laid on the metal flat, and bordered or edged with a run of the metal, to keep the colours aſunder, though there are ſome pieces, the colours of which have been laid on contiguous, and without any partition; which is very difficult to

do, by reaſon the tranſparent colours in melting are apt to run the one into the other; eſpecially in the little works.

The invention of opaque colours is of a much later date, and by much preferable to that of tranſparent ones.

But all metals will not equally admit both kinds; as, for inſtance, copper will not bear all the tranſparent colours, which bears all the opaque ones; but, in laying the tranſparent ones, they are forced, firſt, to cover it with a lay, or couch of black Enamel, and upon that lay leaf of ſilver, and apply upon this other ſuitable colours, i. e. the colours and Enamels proper for ſilver, which itſelf does not allow of all kinds.

Thoſe which ſuit beſt with it are purple, green, azure, and aqua marine. But gold receives all kinds of colours perfectly well, both opaque and tranſparent.

But then the gold uſed muſt be the very fineſt. For, if the tranſparent colours are laid on a baſe gold, they will grow dim and livid; there being a kind of ſmoke that ſettles on it not unlike black lead.

Of tranſparent Enamels the hardeſt are the beſt; although there is a difference even among theſe, ſome retaining their colour in the fire, and others loſing it.

As for the reds, they are only red by accident; they being only yellow when made and applied on the gold, and becoming red in the furnace.

The beſt tranſparent reds, are thoſe made of calcined copper, iron ruſt, orpiment, and calcined gold, melted with the due proportion of glaſs.

But all our fine modern pieces of Enamel are owing to the method of painting with opaque or thick Enamel; particularly thoſe curious ones on gold, repreſenting portraits to as great perfection, as the beſt painting in oil, and even ſome hiſtory pieces; with this great advantage, that their luſtre never decays.

This kind of painting to be in perfection muſt be done on plates of gold; for ſilver turns the whites yellow, and copper, beſides that it emits a fume, which tarniſhes the colour, is apt to ſcale and crackle.

Theſe plates muſt be made a little hollow on one ſide, and raiſed on the other, either in a circular or oval form, to prevent the gold's fretting by the fire, and making the colours crack and fly; nor muſt they be made too thick.

It is enough if they can bear the colours; though it is uſual to ſtrengthen them all around with a circle ſomething thicker. The plate having been hammered very evenly thoughout, a white Enamel is laid on both ſides, although but one of them is to be painted. The deſign of this is to prevent any ſwelling and warping by the fire, for otherwiſe in large pieces, and eſpecially if the

colours be laid on any thing unequally, they are apt to riſe up in puffs and bliſters.

Now this firſt lay which is white, remaining ſmooth and uniform, ſerves as a ground for all the other colours.

The gold plate being thus enamelled with white, the draught or deſign to be painted muſt be chalked hereon, and afterwards the whole accurately drawn out in a ruddy brown.

The draught or outline being thus finiſhed, the piece is ſet to the fire, and then painted with the colours.

The white ground, painted on, ſerves all the colours for white, it being the uſual method to ſpare the ground from firſt to laſt, in the places where the lights are to be, after the ſame manner as in miniature; though they have another white to lay over the other colours, when there is occaſion to raiſe them.

As painters in oil retouch their paintings ſeveral times, and let them dry; ſo in this ſort of painting they touch the piece as often as they pleaſe, ſetting it each time to a reverberatory fire, and taking it away again as ſoon as they perceive the Enamel has got its full poliſh.

The reverberatory fire is made in a little furnace, wherein there is fire both at top and all around; only a void place in the middle, where the piece is to be put for the Enamels to melt. See plate XIII.

The colours are laid on with the tip or point of the pencil, as in miniature; with this difference only, that they uſe oil of aſpic to dilute them inſtead of gum water. See MINIATURE.

The method of ENAMELLING *by the lamp.* The lamp is made either of copper or tin, and conſiſts of two parts, the box and the lamp.

In the lamp, which is a kind of a flat oval, is put the oil, called cabbaline oil, i. e. horſes greaſe, and out of this riſes the wick.

All the uſe of the box is to receive the oil, which the ebullition, occaſioned by the intenſe heat, might throw abroad.

This lamp is placed on a table of a proper height, &c. under which, about the middle of its height is a double bellows like the bellows of an organ, which the workman raiſes and falls with his foot, to increaſe and quicken the flame of the lamps, which is by ſuch means raiſed to a degree of vivacity almoſt incredible.

If there be ſeveral lamps placed upon the ſame table, the wind of the bellows is conveyed to the ſeveral lamps, though there be never ſo many, by means of grooves, cut along the thickneſs of the table, and covered with parchment, extending from the bellows to a tube or pipe placed before each lamp; theſe tubes are of glaſs, and, that the enamellers may not be incommoded by the heat of the lamp, each tube is covered at about ſix inches diſtance,

ſtance, with a piece of tin called a fan, fixed in a hole of the table.

In works which do not take up much time, they only uſe a glaſs blow-pipe, to heighten the flame of the lamp.

When the enameller goes to work, he heats himſelf before the lamp, with his foot on the treddle; and holding in his left hand the piece of work he has to Enamel, or the braſs and iron wires his figures are to be formed with; with his right hand he draws out the thread from the Enamel, held to the lamp; and this with a ſurpriſing dexterity.

So that, by applying the cake of Enamel to the flame of the lamp, he draws it out into threads inconceivably fine.

Thoſe that are made uſe of in artificial plumes of feathers, are ſo very ſlender, that they may be wound on a reel like thread or ſilk.

The factitious jets of divers colours, ſometimes uſed in embroideries, are alſo made of Enamel, and that with ſo much art, that each piece has its hole to paſs the ſilk through, with which it is ſewed. Theſe holes are made by blowing them in long pieces, which are afterwards cut off with a proper tool.

The Dutch or Venetian Enamels are ſeldom uſed pure; the common way is to melt them in an iron ladle with an equal quantity of glaſs or cryſtal.

And, when the two matters are in perfect fuſion, they draw it out into threads of different ſizes, as occaſion requires, by taking a quantity between two pipe ſtopples, held in the two hands, and removing them aſunder, as far as the arms will reach.

If the thread be longer than the workman can ſtretch, a ſecond perſon takes one of the ends, and draws it out while the other holds the Enamel to the flame.

All the threads, drawn after this manner, are round, ſo that, if the nature of the work requires them to be flat, they are afterwards drawn through a pair of pinchers while yet hot.

They have alſo another ſort of inſtrument in manner of plyers, to draw out the Enamel by the lamp, when it is to be worked, or diſpoſed in figures or otherwiſe.

Laſtly, they have glaſs tubes of various ſizes, for blowing the Enamel into various figures, and preſerving the neceſſary vacancies therein, as alſo the ſpare ſtuff, and forming the contours.

There is nothing but what may be thus repreſented by Enamel; and there are figures ſo finely finiſhed of this kind, that one would take them to have come out of the hands of the ableſt ſculptor.

The matter is thus prepared to receive colours for Enamel: Take of this mixture ſix pounds, zaffer prepared three ounces, manganeſe prepared three ounces, reduced to a very fine powder;

put

put them into a glazed earthen pot, in the furnace, for ſome hours; let the pot be very large, becauſe the metal will ſwell much: When it is purified, caſt it into cold water, and dry it; put it into the pot again to melt and purify; then, if the colour is good, keep it for uſe; if not, you muſt put in more or leſs of the colouring matter till it is perfect; and then make it into cakes.

Blue ENAMELS, *or turquoiſe.* Take of the mixture for Enamels ſix pounds, zaffer prepared three ounces, copper, twice calcined, one ounce twelve grains; reduce all to a fine powder, and put it into a white glazed earthen pot; when the metal is well melted, caſt it into water, dry it, and put it into the pot again; let it ſtand till it is well melted, purified, and incorporated; then take it off and make it up into cakes.

Another noble blue. Take of the mixture ſix pounds, plates of copper, calcined, three ounces, zaffer prepared one ounce twelve grains; theſe, being reduced to a fine powder, mix and melt as before, caſting it into water; dry it, and return it into the pot again to melt, purify, and incorporate; then take it off and make it into cakes.

Theſe glorious blues are admired by moſt people, as being the moſt agreeable to the ſight of all others; their beauty and ſplendor being ſo great and tranſcendent above all other colours, they only having the reſemblance of heaven itſelf, for which reaſon the Romaniſts eſteem it a ſacred colour.

A blue turquoiſe ENAMEL. Take of the mixture ſix pounds; put it into a white glazed earthen pot, melt and purify it; caſt it into the water, and dry it; put it into the pot again, melt it, and add to it at times the following mixture:

Take ſcales of copper, thrice calcined, three ounces, zaffer prepared four ſcruples and ſix grains, manganeſe prepared eighteen grains, all reduced to a fine powder; mix them, and ſtir the maſs very well each time with your iron hook, that the powders may incorporate; being well-coloured, take it out and make it into cakes.

But you muſt obſerve, that the colour is right, good, and perfect, before you empty your pot; for experience muſt teach you how to proportion the tinging ingredients, as to more or leſs; if there be too much of the tinging matter, add more of the mixture; if too faint, add more of the tincture, or tinging matter, or powder, till the colour is as you would have it.

As this colour is very fine, ſo it is very difficult to make well, and requires many trials and much experience; therefore you muſt not be diſcouraged, if you fail in your firſt eſſays; for, by continuing to make farther trials, you will at length effect what you

you deſire, and be able to judge and know, when you are in the right, and when in the wrong.

A blue, for painting on ENAMEL. Take any of the foregoing Enamels, purify them with aqua-fortis, and grind them with oil of ſpike, as for other colours; theſe are ſome of the nobleſt that can be uſed for this work.

2. Take painters Enamel prepared, put it into a glaſs bottle, add to it aqua-vitæ, ſo as to cover it four inches, four times a day, ſo will the groſſer parts fall to the bottom; decant the clear liquor, evaporate the ſpirit, and dry your azure, and it will be very fine; then grind it on a marble, and it will be fit for this work, and far beyond ultramarine; which yet may be made uſe of as occaſion requires.

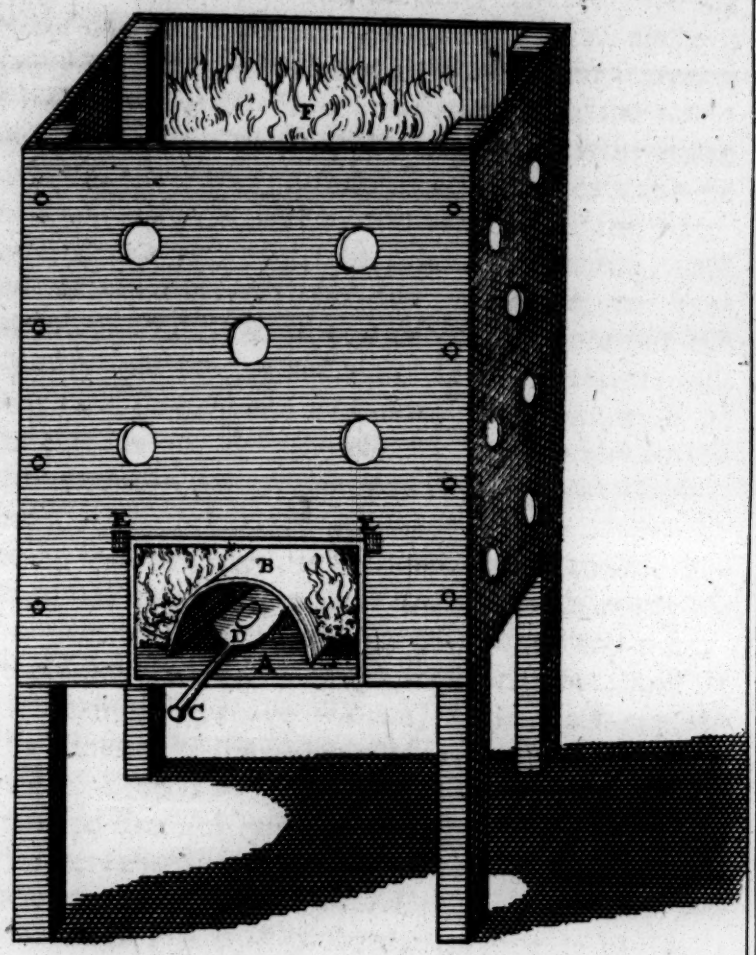
Proper rules and matter for all ſorts of ENAMEL, *with directions for qualifying the fire, in order to ſucceed well.* This moſt agreeable way of enriching gold by Enamel, which proceeds from the beautiful variety of colours which may be applied, being an art no leſs painful than neceſſary for ornament, we proceed to lay down ſuch methods in this book, as ſhall equally anſwer the benefits of the public, and ſatisfaction of the more curious.

We propoſe, in the firſt place, to give direction for the choice of matter to be uſed; and then ſhew the preparations for all ſorts, and how to make and ſuit the colours moſt convenient on Enamel.

The method, not only uſed by the goldſmiths, but by ſuch as form portraitures with it of all ſorts, as men, beaſts, fowl, and other curioſities, very naturally, by a juſt diſpoſure of the colours, is moſt admirable; to effect which, no more is required than a lighted taper, and a hollow pipe of metal, for that purpoſe, to blow the blaze to the matter, and make it malleable and ſoft, and then the ſeveral figures are drawn or impreſſed thereon.

And this may be ſo far improved and heightened, as to admit of performances, rather to be thought the eſſay of a divine than human artiſt: Witneſs that notable piece, of a chariot drawn by two oxen, of which Cardan takes notice in the fifty-ſecond chapter of his tenth book, which was ſo completely done in miniature, that the whole might be covered with the wings of a fly; the ſhip rigged, and man armed, which, Howel ſays, he ſaw; thoſe little ſtatues of men, with ſeveral other curioſities of figure, Vornicus alſo aſſures us of; not to omit the church of St. Mark, at Venice, where the moſaic work is plentifully interlaced with hiſtory of all ſorts, diſtinguiſhable by the variety of colours and gildings, and all conſiſting of ſeveral different ſubjects. In ſhort, what account Agricola has left us of theſe matters, in his twelfth book, give us no leſs cauſe to admire this art than he had, when

Facing P. 268. Plate. XIII.



A. *The mouth of the Furnace*
B. *The Cover*
C. *An iron Peel*
D. *The Enamel to be melted*
E. *The Grates*
F. *The inner part of the Furnace*

he ſaw ſuch notable pieces of which he makes mention, and which he aſſures us was deſervedly very great. The uſe of Enamel is very ancient; however, that of working on metal is more modern, and, for the great perfection to which it is arrived, we are obliged to this preſent age.

To prepare the matter for ENAMEL. Take lead in pigs thirty pounds, plate-tin of Cornwal thirty-three pounds; mix and calcine them as directed for lead, preciſely obſerving the directions there laid down: This done, ſearce the calx, and put it all into a glazed earthen pot, filled with water; put it over a fire, and let it boil a little; then take it off, and pour the water gently into another veſſel, which will carry along with it the more ſubtile calx. Repeat this until no more of the calx can be ſubtiliſed, which you may diſcover by the pureneſs of the water in pouring it out of one veſſel into the other. After this, calcine the remains of what is in the firſt pot, as before, and thus continue to calcine and ſubtiliſe till you can get no more of the ſubtile calx. Laſtly, put the waters out of all the receivers into larger, and ſet it on a ſlow fire to evaporate. The fire muſt be very gentle, for this reaſon, that the calx do not founder or fall to the bottom, but continue more fine and ſubtile, than when it was firſt calcined.

Your calx being thus prepared, take thereof about twenty-five pounds, and as much frit of white tarſo beaten and ſearced; to theſe add four ounces of ſalt of tartar, finely ſearced and prepared; mix all theſe powders very well together in a pot, and let it ſtand in the glaſs-houſe furnace or oven, about ten hours, to digeſt and purify; then take them out, and, reducing them to an impalpable powder, keep it in a cloſe dry place for uſe. Thus muſt your matter for Enamel be prepared to receive the colours; but of that more hereafter.

To make ENAMEL *of a milk-white colour.* This colour, of all others, is the pureſt; it is uſed for the ornaments of virginity, the emblem of innocence, as alſo the ſymbol of candour and chaſtity. To perform this, do thus: Take ſix pounds of the prepared powder, and twenty-four grains of manganeſe of Piedmont prepared; mix them well together, and put them into one of your furnace pots to melt and purify over a very ſwift fire, which will be done in a little time. The matter being thus melted, take it out of the pot, and throw it into very fair water, and, being afterwards dried, put it again into the pot to melt; do thus with it thrice, changing the water. When you have thus purified it, if you find it juſtly white, it is good; but, if it be greeniſh, add a little more manganeſe, and it will become as white as milk, and fit Enamel for gold, or other metal:

tal: Take it off the fire, make it up into cakes, and keep them for uſe.

A turquoiſe-blue ENAMEL. This colour of the turquoiſe, or Turkey-ſtone, is very fine for Enamel, but withal very difficult to make well, and requires a great deal of experience. But now for the Enamel, which to make of this turquoiſe colour, you muſt put, of the prepared powder, ſix pounds into a white glazed pot to melt and purify it; then caſt it into water, and when dry put it again into the pot; and, being melted over again, add to it, at four times, this compoſition, viz. ſcales of copper, thrice calcined, three ounces, prepared zaffer eighty-ſix grains, manganeſe prepared forty-eight grains; mix all theſe, and reduce them to a very fine powder; ſtir the matter very well each time with your iron hook, that the powders may incorporate, and for reaſons given elſewhere.

Thus, when your matter is fully and well tinged, take the approbation of a goldſmith on ſome of it, as to the colour, that you may have the more aſſurance, before you proceed to empty your pot. Your own experience muſt ſhew you how to proportion the ingredients for tinging the matter more or leſs. If you perceive that the tinging powders are too predominant, add the more principal prepared powder; if it be too faint, add the greater quantity of the tinging powders; and thus do to improve or leſſen the colour until it be to your ſatisfaction.

To make a very fine blue ENAMEL. You may make Enamel of this colour with four pounds of the principal prepared powder, two ounces of prepared zaffer, and forty-eight grains of copper thrice calcined; theſe, reduced to a mixed impalpable powder, muſt be put into a white glazed pot; when the metal is well melted, caſt it into water, and when it is dry put it into the pot again; after that, let it ſtand upon the fire until it be well digeſted and incorporated; then take it off, and you have a very fine Enamel for goldſmiths, which make into cakes, and keep for your uſe.

Another blue ENAMEL. This Enamel is altogether as gay as the former, only the colour is not the ſame, for which reaſon it is preſcribed here.

To make which, take four pounds of the principal prepared powder, two ounces of plates of copper calcined, forty-eight grains of prepared zaffer; mix and reduce them to an impalpable powder; put this into your white glazed pot, and, having melted the metals until they incorporate, caſt it into water, whence, being dry, return it to your pot, and let it remain there until it purify; when the colour is well mixed to your ſatisfaction, take it off and cake it as before.

To make a pretty green ENAMEL. It may be very perfectly imitated,

imitated, if you put four pounds of the principal powder into your white glazed pot, and let it melt and purify ten or twelve hours in the furnace; afterwards caſt it into water, dry it, and put it into the pot again, and let it be fully refined; then take ſcales of copper thrice calcined two ounces, ſcales of iron, at the ſmith's forge on the anvil-block, forty-eight grains; mix and reduce them to an impalpable powder, and throw it, at three ſeveral times and portions, into your pot of principal matter, ſtirring the metal very well, that it may be equally tinged by the mixture of the colours: If it be to your fancy, and of a pleaſant colour, let it ſtand a-while on the fire, until it be thoroughly incorporated; thus take it off, and you will have a delicate green Enamel, very proper for all ſorts of goldſmiths work.

Another green ENAMEL. The colour of this following is ſomething different from the former, but no leſs excellent. Take ſix pounds of principal powder, two ounces of feretto of Spain prepared, forty-eight grains of crocus martis prepared with vinegar; make theſe into an impalpable powder, mix them well, and put theſe into your white glazed pot; let it remain in the furnace to melt and refine the matter; afterwards caſt it into water, and again into your pot, having refined it before, until it refine very well; when it is melted, obſerve whether the colour be ſatisfactory, and let it ſtand ſome hours longer to refine, and when it is taken off you will have a very fine green Enamel for goldſmiths.

If the colour be too faint, add more tinging powder proportionably enough to perfect it.

Another. There is another way to make green Enamel, after this manner: Put into a white glazed earthen pot four pounds of principal powder, and let it refine in the furnace a little while; caſt the metal afterwards into water, and, being dried, again into the pot; then add, at three equal portions, this powder, compounded of ſcales of copper thrice calcined two ounces, and of crocus martis, prepared with vinegar, forty-eight grains; let theſe be well mixed and powdered together, ſtirring the metal with the iron hook to incorporate it; let it remain on the fire until it be well refined, and, when it is perfectly coloured to ſatisfaction, take it off and keep it for uſe.

To make black ENAMEL. It is moſt neceſſary in this art, and can leaſt of all be ſpared; becauſe it has a peculiar beauty which ſets it off among the more ſplendid and ſparkling pieces. You may make a very good velvet colour with four pounds of the principal powder, two ounces of prepared zaffer, and two ounces of manganeſe of Piedmont, prepared as before directed; mix and pulveriſe them very well together, and put them into a glazed earthen pot in the furnace for ſome hours; the pot muſt be more

than ordinary large, becauſe the metal will riſe very much; when it is purified, caſt it into water, dry it, and then return it into the pot to be refined over again, which will be in a little time; then ſee if the colour be to your fancy, and, according as you find it, put in more or leſs of the former ingredients, and, having thus perfected it, take it off and cake it: This Enamel will be a good velvet-black for goldſmiths.

Another black ENAMEL. This ſecond ſort is diſtinct from the other by the difference of the quantities and tinging ingredients.

Take ſix pounds of principal powder, two ounces of zaffer prepared, two ounces of crocus martis prepared with vinegar, two ounces of feretto of Spain; pound and mix them very well together, making an impalpable powder, and put it into your glazed pot in the furnace to melt and purify; when it is well digeſted, caſt it into water, dry it, and put it again into the pot, where let it remain a while to refine; when it is for your purpoſe, take it off and cake it as uſual, and you will have a very good and moſt convenient Enamel for the goldſmiths to ſet in colours and Enamel with.

Another black ENAMEL. Here is a third way of making the velvet-black Enamel, much better and of a finer gloſs than the former.

To make which, take four pounds of principal powder, four ounces of red tartar, two ounces of manganeſe of Piedmont prepared; reduce theſe to a very fine powder, and put them into a glazed pot bigger than ordinary, becauſe of the riſing of the metal; let it melt and digeſt in the furnace, and caſt it into water, and when it is dry put it into the pot again, there to remain until it melt and refine anew; when you find the colour proper for your uſe, make it into cakes, and keep it for the goldſmiths uſe.

To make purple-coloured ENAMEL. Take four pounds of principal powder, add to this two ounces of manganeſe of Piedmont, prepared as for red Enamel; put theſe into a white glazed earthen pot, allowing it room enough to bear with the ebullitions and riſing of the metal; when it is thoroughly melted, caſt it into water, dry it, and put it again into the pot to refine; then conſider whether it be well enough coloured, and accordingly make it up into cakes and keep it for uſe as before.

Another purple ENAMEL. This is no leſs delicate than the former, for all manner of goldſmiths work.

Take ſix pounds of the principal powder, three ounces of manganeſe of Piedmont prepared, ſix ounces of ſcales of copper thrice calcined, as before preſcribed; reduce theſe to an impalpable powder, and let them diſſolve and refine in the white glazed

zed pot in your furnace; afterwards caſt the metal into water, dry it well, and return it into the pot to refine over again; examine the colour if it be right; take it off and cake it up for uſe as before.

To make ENAMEL *of violet colour.* Take ſix pounds of principal powder, two ounces of manganeſe of Piedmont prepared, and forty-eight grains of thrice calcined ſcales of copper; make all into a very fine powder, and, being well mixed, put them together into your white glazed earthen pot in the furnace, let it melt and digeſt; then caſt it into water and dry it; put it into the pot again, and let it refine very well; try its colour, and, if it is agreeable, take it out and cake it, and you will have a very fine violet-coloured Enamel, proper for all manner of goldſmiths work of that ſort.

To make yellow ENAMEL. Take ſix pounds of principal powder, three ounces of tartar, ſeventy-two grains of prepared manganeſe; reduce all into an impalpable powder, mix it well, and put it into a glazed earthen pot, large enough to diſpenſe with the ebullition and riſing up of the metal; let it ſtand in your glaſs-houſe furnace to melt and incorporate; afterwards caſt it into water, then dry it, and leave it in the pot again to refine very well; then try the colour, and, if it be ſufficient, make it into cakes as before, and you will have a very taking yellow Enamel for all ſorts of metal except gold, which by its reſemblance would only dull and ſpoil the beauty, unleſs it were placed among other colours, as the goldſmiths already are very well acquainted withal.

To make a cryſtal ground for red ENAMEL. The red requires a cryſtal more laſting than any of the former, therefore the following is a compoſition fit for that purpoſe:

Take twenty-four pounds of ſalt of polverine, rochetta, or ſoda, prepared, and ſix pounds of frit; theſe, mixed and finely powdered, muſt be ſteeped in water, to bring the maſs into a body like paſte, and then make it up into ſmall thin cakes, lay them on tiles in a lime-kiln or potter's furnace, for ſix hours, to calcine, or near the glaſs-houſe furnace vault, or on the upper vault, taking ſpecial care that they do not melt; let them remain there for three or four days, or until they be very well calcined.

This done, reſolve them into an impalpable powder, adding thereto four pounds of calx of lead and tin prepared and calcined according to directions; four pounds of white calcined tartar; theſe being mixed and very finely pulveriſed, put them into your glazed pot, at the glaſs-houſe furnace, to melt and refine; thence throw the metal into water, and again, when dry, into the pot to melt; caſt it a ſecond time into the water, and dry it; let it

melt and refine over again in the pot for ſome hours, and it will be fit for uſe.

Conſider always the lead which is among the other ingredients, and be very careful that you let none of it remain in the pot, when you throw the matter out into the water, for it will be apt to precipitate to the bottom, and this for ſeveral reaſons elſewhere given.

An excellent preparation of fuſible manganeſe to be uſed in making red ENAMEL. We have given ſufficient direction elſewhere, to prepare manganeſe of Piedmont, for tinging theſe matters, of which we have already diſcourſed; but, for red and roſe colour Enamel, there are ſome more exquiſite ingredients and preparations required, which we ſhall give an account of here, before we ſpeak of the Enamel itſelf.

Any other than manganeſe of Piedmont will not ſerve the purpoſe, for that only is fit for the uſe to contribute to the fairneſs and life of the colour; take therefore equal quantities of this manganeſe and ſalt-petre, as much as you pleaſe, and let them reverberate and calcine in an earthen pot in your furnace twenty-four hours; then take it out and waſh it well in warm water to ſeparate the ſalt-petre, dry it well, and the maſs will be of a red colour: To this add an equal quantity of ſal armoniac, grind theſe on a marble with diſtilled vinegar, as painters do their colours; dry it, and reduce it to powder, putting it afterwards into a ſtrong matraſs or bolt-head of glaſs, big-bellied and long-necked, there to ſublimate about twelve hours; break your matraſs, mix all the volatile and fixed parts together, adding the ſame quantity of ſal armoniac, as there are flowers, and take care to weigh them before compoſition; grind, pulveriſe, and ſublime as before, repeating this until your manganeſe remain fuſible in the bottom of the matraſs; and this is that which you muſt preſerve to tinge cryſtal with, and make it ruddy and diaphanous, or tranſparent as a ruby.

The way to make a fixed ſulphur, to be uſed in compoſitions for ENAMEL. This fixed ſulphur ſerves for ſeveral uſes in chymiſtry, and very convenient for obliging young artiſts.

Now, though it be not ſo unavoidably neceſſary for making red Enamel, yet we will not omit it here, becauſe it contributes to our preſcribing two ſorts of ways for it, as well as to ſatisfy the more curious goldſmiths.

Put flowers of ſulphur, as much as you pleaſe, into a glaſs cucurbit luted at bottom, pouring thereto oil olive as much as will drown the matter by two inches; ſet the cucurbit on a violent ſand furnace for a full hour; then take it off, and pour in ſtrong vinegar, and the ſulphur will ſoon precipitate, and the oil aſcend on the ſurface of the vinegar; decant this from the

ſulphur into another veſſel, and put in more freſh oil as before; do this thrice, and you will have at length a fixed ſulphur to make uſe of for Enamel.

Another fixed incombuſtible ſulphur. There is yet another way for fixation of ſulphur for the ſame uſe, and ſeveral chymical operations, wherein it has very great virtue.

Make ſtrong ley of quick-lime and harſh oak aſhes; put therein flowers of ſulphur, until the liquid ſurface be four inches uppermoſt; boil it for a conſiderable while over the fire; this will cleanſe and purge the ſulphur from its unctuoſity and corruption, and qualify it for your purpoſe. Separate the ley from the ſulphur, and, drying it, you will have it white, fixed, and incombuſtible, exceeding proper for the goldſmiths to make uſe of on gold.

To extract ſpirit of ſaturn, an excellent ingredient for ENAMEL *and glaſs-work.* We think fit to propoſe all the preparations proper for making a red Enamel, before we ſhew the way to make it; becauſe the ingredients to be uſed muſt firſt be provided, in order to proceed regularly to our buſineſs.

Reduce good litharge, as much as you pleaſe, to an impalpable powder, and ſet it in a glazed earthen veſſel over a ſtill fire; add to this good diſtilled vinegar, till four inches above it; mix them well together, and then let them ſettle until the vinegar become milk-coloured, which will be in a little time; decant this vinegar off gently, and put on freſh, continuing to do thus until it admits of no more colouring; then put all the milk-coloured vinegar into a glazed earthen veſſel, and let it ſtand until the lead precipitate to the bottom; from whence pour off the clear vinegar, which will be at top; and that milk-coloured ſediment which remains, is what we call ſpirit of ſaturn, though improperly, and that which we make uſe of for the Enamel and glaſs.

If it do not precipitate well to your liking, and that the vinegar at the top be not clear, caſt ſome cold water among it; if that will not do, and that your vinegar continues muddy, ſet all the water and vinegar together over a gentle fire to evaporate, and thus you will have the more ſpirituous part of your vinegar a ſediment in the bottom of the veſſel, which is exceeding uſeful for glaſs work. Keep it together with the reſt of the ſaturn for uſe.

This noble preparation, which we call ſpirit of ſaturn, does indeed contain it, but you muſt have ſkill to extract it thereout. To ſay that it is all ſpirit of ſaturn, is untrue, for it is that wherein the ſpirit is contained, and from whence it may be more eaſily and better ſeparated, than from the maſs of lead; I propoſe

this firſt ſtep towards extracting it as ſuch, whereby the curious may ſucceed with little trouble.

To make ENAMEL *of a blood colour red.* To ſtain Enamel of this colour, take ten pounds of common frit, add to it ſix pounds of glaſs of ſaturn prepared, make all into a very fine powder, which muſt be put into a glazed earthen pot at the glaſs-houſe furnace, to melt, boil, and refine; after this, caſt thereon powder of thrice calcined copper at diſcretion, ſtirring all about that they may incorporate together with powder of red tartar until it be perfectly ſtained; and thus you will have a delicate deep ſanguine Enamel fit for all manner of work you can deſire to apply it to.

Another blood colour ENAMEL. This Enamel will be very beautiful, and may ſerve inſtead of the roſe colour Enamel hereafter preſcribed.

To make which, put ten pounds of frit for cryſtal, and ſix pounds of glaſs of ſaturn before-mentioned into one of the glaſs-houſe furnace pots; let it melt and purge well; after this caſt it into water, dry it, and return it into the pot; when it is well melted again, throw in, at ſeveral times, five or ſix ounces of powder of thrice calcined copper, ſtirring all together with the iron crook to mix and incorporate them well together, and alſo a like quantity of powder of red tartar, ſtill ſtirring it; this being well boiled and refined, obſerve if the colour be perfect; if not, add equal parts of the powders of copper and tartar, as much as you find neceſſary to bring it to perfection. Let it remain to boil and purify, trying it again and again, until you find it completely coloured.

Another red ENAMEL *of a very ſplendid ruby colour.* The beauty of this Enamel is very ſurpriſing, and of as lively a luſtre as the ruby itſelf, which it communicates to all the work wherein it is uſed.

For this fine effect, we muſt have recourſe to the fuſible manganeſe, of which add twenty ounces to each pound of cryſtal ground: Let the whole be well purified; then try the colour, and, according as you find it, add the greater or leſſer quantity of manganeſe, or cryſtal ground reſpectively, until it be brought to its juſt degree of perfection, as a ruby, and which ought to be very admirable.

Another ballas ruby colour ENAMEL. The ſame manganeſe muſt be had to make this fine colour; put ten pounds of cryſtal ground in a glazed pot, to melt and purge at the glaſs-houſe furnace; throw the matter into water, dry it, and melt it over again; do thus thrice, and, when the maſs is afterwards well melted, tinge it with the fuſible manganeſe as before, and it will become purple-coloured. Add to it at eight times impalpable

powder of alum to bring it to a red. Be very careful that the alum do not blacken it; but rather make it yellowiſh, and, the manganeſe diſſipating, it will become red, and ſo make the colour moſt perfect and juſt, of a fine ballas ruby.

Another ENAMEL *of a roſe colour for gold.* Take ten pounds of cryſtal gold, melt it at the glaſs-houſe furnace in a glazed pot; add to it at four times five ounces of red calcined copper, ſtirring the metal every time; then put into it crocus martis, and manganeſe prepared as before; then let it alone to cleanſe for ſix hours, and, if the colour is not true, put in by little and little more crocus martis, until it be of a fine roſe colour.

Another very fine roſe colour. Among our roſe colour Enamels, this ſeems the fineſt; to make which, take four pounds of cryſtal ground, let it melt in a glazed pot at the glaſs-houſe furnace; caſt it afterwards into water, and, melting it over again, add by little and little an ounce and a half of calx prepared, ſtirring the metal every time to incorporate; then let it alone for a little while, until you perceive it of an aſh colour; when it comes to that, forbear putting in any more calx, leſt you make it too white; then refine the maſs, and afterwards add to it minium, two ounces; purge, refine, and throw it out into water, and, putting it into the pot, let it ſtand to melt, and purify over again about eight hours; then put in an ounce and a half of red thrice calcined copper, and as much crude white tartar, with a drachm of blood-ſtone, and the like quantity of fixed ſulphur; theſe pulveriſed very fine and mixed together; ſtir the metal, and incorporate them very well together: Afterwards ſee if the colour anſwers your expectation; if it be too deep, add a little more manganeſe to weaken it; if it be too pale, improve it with ſome more of the laſt compoſition of copper tartar, blood-ſtone, and ſulphur, until it be to your purpoſe. And thus you have an Enamel of an exceeding fair roſe colour.

Another roſe colour ENAMEL. Set ſix pounds of cryſtal ground in a glazed pot at the glaſs-houſe furnace to melt and cleanſe; then caſt into it, at four ſeveral times intermitting, four ounces of calx as prepared of lead and tin; ſtir the matter very well at each time, until it incorporate; then let all purge for a while, and caſt it ladleful by ladleful into water, and again put all into the pot to melt and refine anew; after this, add to it an ounce and a half of red copper pulveriſed and calcined, which will tinge the whole of a deep colour, but caſt it in at three intervals, and ſtir it very well to incorporate. Two hours after, add to it, at thrice, an ounce and a half of crocus martis; mix it well as before, and let it remain to refine about three hours; then throw on it ſix ounces of tartar calcined, chimney ſoot vitrified, one ounce, crocus martis again one ounce and a half pulveriſed, and

all well mixed at four ſeveral intermiſſions and quantities, ſtirring the metal always with the iron crook; let it ſwell, but not boil over. After this, let it repoſe and purify about three hours; ſtir it again and try the colour; if it be red as blood, it is right; if not, add, at diſcretion, a little more of each of theſe powders of tartar, ſoot, and crocus martis, until the colour be full and true, and ſo let it ſtand for a whole hour, and try it again; if you find it perfect, proceed no further, but keep it for uſe, it is very proper to apply to gold for Enamel.

Another ſplendid ENAMEL *of a carbuncle colour.* Take very pure gold, and, for the better aſſurance, refine it yourſelf, and diſſolve an ounce of it in three ounces of aqua regalis; let the ſolution diſtil over a gentle fire until the gold precipitates, and thus repeat an exhalation and cohobation ſix times, and the laſt time take out the gold; powder and put it into a crucible covered and luted, on a reverberatory to calcine; let it remain until it become of a very excellent and ſcarlet red, which will not be without a conſiderable allowance of many hours.

This done, take of the cryſtal ground, and melt a quantity of it in a glazed pot at the furnace of the glaſs-houſe; and, being well purged, throw in a twentieth part of the powder of gold, in proportion to the quantity of the metal, ſtirring the whole very well; let it alone for ſome time; then try it, and, according as you find the colour, put in more powder, until you bring it to a true tranſparent carbuncle colour.

We have given another way to calcine gold, no leſs ſufficient than this, together with a way to make a fine carbuncle; and this rare colour may as well be given to the ſtone as the Enamel, by the directions for preparing the gold; the curious may chuſe which they will, they being equally ſufficient.

The way to calcine copper for making vitriol of venus, without corroſive. The calcining of copper is the firſt preparation to be made in making the vitriol of venus without corroſive, which is known to very few, and whereof we have already given an eulogy.

Take thin leaves of red copper, and put them into crucibles, ſtratifying them layer upon layer with powder of common ſulphur, filling your crucibles until all the copper leaves be put in; then cover well, and lute the crucibles; let the lute dry; and put them into the furnace, continuing a good charcoal fire for two hours; afterwards let them ſtand and cool; then take off the crucibles, and you will find your copper calcined and blackiſh, inclining to a deep purple powder; ſearce it, and to each pound add ſix ounces of powder of ſulphur; mix, and put them into a round flat-bottom earthen pot, ſtrong enough to bear the fire;

fire; lay upon the furnace a ſtrong earthen diſh, fill it with very live coals, and place your pot thereon with the copper; when the pot grows hot, and the ſulphur takes fire, ſtir it with your long iron crook, leſt it ſhould ſtick to the pot, or become concrete; continue thus till the ſulphur be all conſumed and ſmoaks no more; take the pot hot off the fire, and empty the copper out with an iron ladle; pound it well in a braſs mortar, and ſearce it all finely, and you have a blackiſh powder; reiterate this calcination thrice, with the like proportion of ſulphur as before, and the third time let it remain until the copper become red and yellow; then take it off and pound it in a braſs mortar, and ſearce it finely, pounding what remains over again, until all be ſearced, and you will have a very well coloured calx of copper, moſt effectual and proper for extracting this fair vitriol of copper, whereof the following is the preparation.

To make vitriol of venus, without corroſive. Thoſe who make vitriol of venus have not all one and the ſame method, moſt of them diſſolve the copper in diſtilled vinegar, ſpirit of nitre, or ſome other corroſive; for our part, water alone is the diſſolvent, or rather agent to extract the tincture, as we ſhall ſhew.

Take glaſs cucurbits as many as will ſerve your purpoſe, to contain all your calx of copper, and put ſix pounds of fair running water to a pound of calx, into each cucurbit; place them on a moderate ſand furnace for four hours, to evaporate until one third of the water goes off; let the furnace cool, and afterwards decant the remainder of the water into other glaſs-veſſels, and dry the ſediment in a crucible on the furnace. Let this water ſettle for two days, and then you will find in the bottom of the veſſel ſmall grains of copper of a blackiſh colour; you muſt filtrate or ſtrain the water, and preſerve all the grains together, to add to the former ſediment, having firſt well dried them, and keep the water.

Take all theſe ſediments, and to each pound add ſix ounces of ſulphur powdered as before, putting it into your flat-bottomed earthen pot to calcine; take care to ſtir it well as long as the ſulphur fumes, and it ſtands over the fire, elſe it will ſtick to the pot, and not calcine; take it off and powder it immediately in a braſs mortar; ſearce the powder, and you will find it black; mix this again with ſulphur proportionably, ſix ounces to a pound, and put it to calcine anew, ſtirring it very well as before directed; let it ſtand a while on the fire to alter the matter from a ruſſet to a yellow; then take it off and pound it inſtantly in a braſs mortar before it cool, and then ſearce it all finely over.

Put a pound of this powder with ſix pounds of water into each cucurbit, and theſe cucurbits on a ſlow ſand furnace, where let it ſtand four hours to the conſumption of one third of your wa-

ter, which decant into other veſſels; let it ſettle two days; then filtrate theſe waters, and pour them among the former, gathering the ſediments that remain in the bottom, and mix them with theſe in the cucurbits.

Dry the remaining ſediments as before, and repeat the calcination anew with the ſame proportionable quantity of ſulphur; then extract the tincture, filtrate and mix the filtrated and tinged waters with the former, exactly obſerving the order already taught, and continue to do this ſix times; ſo will the copper remaining in the bottom of your veſſels become as it were a ſoft impure earth deprived of all its blueneſs, which throw away as fit for nothing; for all the virtue of the copper is contained in the waters; put theſe all carefully together to extract from them this precious vitriol of venus, as hereafter directed.

The way to extract a fair vitriol of venus from our coloured waters. Of all the preparations to be taught for this rare work, this is the moſt eaſy and common, there being no more required, than to evaporate and cryſtalliſe the matter; but, as we are to leave nothing in the dark, we reſolve to explain every circumſtance thereof for the benefit of our readers, and ſuch as would know it.

We have ſaid you muſt mix all your coloured waters, now we will tell what muſt be done with them; you muſt have a low glaſs cucurbit that will hold two quarts or more, which put into a moderate aſh or ſand furnace; put therein three pounds of the tincture to evaporate gently, and put the reſt into glaſs bottles ſet round your furnace, ſo that they may be heated, and ready to fill the cucurbit as faſt as the exhalation conſumes its tincture, which may be done with a glaſs ladle, or the bottles themſelves, leſt the water being cold might cauſe the cucurbit to burſt, and ſo all would be loſt.

Reduce ten pounds of this by evaporation to two and a half, or three at moſt, which will be a very high tincture; pour it into two or three glazed earthen veſſels, and place them all night in a moiſt cold place, and you will find the vitriol at bottom, and ſticking to the ſides of the veſſel, like little long icicles, which will have the true colour of oriental emeralds; pour all the remaining waters into the cucurbit, and dry the vitriol that it may not ſtick, preſerving it in a cloſe veſſel.

Place your cucurbit again on the furnace to evaporate anew to the conſumption of half the waters, and cryſtalliſe the ſtrong tincture as before. Thus, whilſt any water remains, evaporate and cryſtalliſe until all be conſumed, to the end that none of this may be loſt, whoſe virtues are infinitely uſeful, not only in the art of glaſs and the metallic, but in phyſic too, for the curing of many diſtempers, which we will paſs over as foreign to

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our ſubject, and go on in preſcribing the reſt of this rare work, and conceal nothing from the curious, but give them intire ſatisfaction.

The method of drawing the ſpirit of the vitriol of venus, which has a wonderful blue, and how to ſeparate the caput mortuum for tinging of glaſs. Put a pound of this vitriol into a glaſs retort ſtrongly luted; the lute being dry, ſet the retort in a ſand furnace, fitting to it a very large receiver, as directed for aqua-fortis; this done, kindle the fire, and continue it gently for four hours to prevent a too exceſſive heat, which would drive out the ſpirits impetuouſly, and ſo burſt the receiver, whereof great care muſt be taken not to ſpoil all. As ſoon as the ſpirits aſcend like white clouds, improve your fire by degrees, until they diſperſe and your receiver clear again and cools, and all the ſpirit comes together: Then let the fire go out of itſelf, and, after twenty-four hours, unlute the joints, take away your receiver, and put the liquor it contains into glaſs bottles, and ſtop it very cloſe with glaſs ſtopples to prevent air, which, if they could draw, would diſperſe it all by exhalation. This choice liquor has that noble blue which affords us wonderful tinctures, and other inеſtimable operations, as well as ſuch ſurpriſing effects in phyſic, as cannot be equalled.

But to return to our caput mortuum of this precious vitriol, which has occaſioned us to give its preparation, and is what we make uſe of for this fine water colour, or egmarine on glaſs, you will find it in the retort, out of which the white ſpirit was diſtilled, whereof we have already treated. To get it, you muſt break the retort; then reduce it to powder with a mixture of zaffer, and ſo tinge your cryſtal of an admirable ſea-green colour.

We were miſtaken in ſaying before, that the caput mortuum muſt be expoſed to the air, before you pound it with the zaffer, for that is not altogether incumbent in tinging of glaſs, though this expoſing of it cannot but add ſomething to the luſtre, for it draws thereby, with a certain magnetic property, the occult ſpirit of the air, and ſo from a black, of which it was before, becomes of a pale blue colour, and partly aſſumes what is loſt by diſtillation and extraction of the ſpirits; ſo you may ſave a great deal of time and pains by this preparation, to your no ſmall advantage in expediting the matter.

The way to ENAMEL *in all ſorts of colours on gold and other metals.* The ancient works of Enamel on metals were only of black and white, with ſome few tinges of carnation, or fleſh colour, as may be ſeen in the Limoge Enamel. In Francis the Firſt's time it became more improved, and they made uſe of lights and ſhadows; but the Enamel on gold was of no better ſtuff than that on copper, and all the works of it on gold, ſilver,

ſilver, and copper, were of tranſparent matter; ſuch as wrought it on thick, couched each colour by itſelf, as is done now-a-days in enamelling ſome particular pieces of relief, and no otherwiſe.

Since they have found out the way of enamelling with opaque and thick ſtuff, and the art of compounding the colours is much more improving and handſomer than that of the ancients, as is viſible in all our modern works; we muſt, without all exception, own the fair works upon gold, repreſenting portraitures and intire hiſtories, ſo neatly, and to the life, and coveted as much as picture done in oil, over which it has the advantage of natural luſtre and varniſh, which is never tarniſhed, to be the invention of this latter age, and the improvements therein we owe to the French.

All ſorts of Enamel are not to be promiſcuouſly employed on all ſorts of metal. Gold, which perfectly bears with, as well all the opaque as tranſparent, cannot agree with clear purple, its yellow mightily changes the colour thereof, and produces but a very ill fancy. On the contrary, this purple is very fine on ſilver; ſo the egmarine, the azure, and green, all other colours, as well clear as opaque, diſagreeing therewith; and copper ſuits with every thick Enamel, but cannot endure the limpid, unleſs prepared for it beforehand, as ſhall be ſhewn in due place.

Obſerve, that good Enamel muſt be hard and laſting, ſuch as is ſoft being full of lead, and ſubject to change colour, eaſily becoming ſullied and foul. Of the clear Enamel, ſome is harder, ſome ſofter; the hardeſt is always the beſt, however, even of them there is choice; ſome loſe colour in the fire, ſome are more or leſs lively and ſparkling; but, if you employ conſtantly ſuch as we have before deſcribed, you will never meet with thoſe inconveniences; for the ingredients, being perfectly cleanſed, will endure all degrees of fire, any change of colour or quality not enſuing.

Of the furnace for enamelling and portraying. The enamelling of metals, as well as the colouring of the ſtuff, cannot be effected without fire, and is wholly different in this point from painting with the uſual colours in oil, which may be dried in the air only, without other help.

It would be very hard to believe the fire would not ſpoil the mixture of the colours, if our daily experience which we made, did not vouch the contrary; however, care muſt be taken not to let the work have too much time, but draw it out as ſoon as you find it poliſhed.

The fire muſt be reverberatory, or rather of ſuppreſſion, and never to be under the ſtuff; it is the ſame as is uſed for cleanſing of metals, whether in mints or goldſmiths ſhops, which is very familiar to all the world.

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You muſt have the furnace round or ſquare, either of iron or earth; it is no great matter, how, or whether of theſe, it is; which muſt be hollow in the middle, to contain the work with a good charcoal fire all about, and over it, to make it melt the better; and you muſt have it ſo as to be able to take your ſtuff out, and put it in again, as occaſion requires. You may, for better conveniency, make uſe of a goldmith's muffle; it is a ſmall arch, made of crucible earth, in the ſhape of half a crucible, cut lengthwiſe, and they place it on the area or floor of the furnace, the opening of it lying juſt againſt the mouth of the furnace, to put in and draw out the work eaſily; and, for more conveniency, they place a ſmall grate over it, which muſt not touch it, for fear of breaking it; and on this grate make a good fire, and ſo round about the muffle, to heat the hollow very well, under which they put the work to be enamelled and painted; and the eſſays or trials they have a mind to make on a little iron ſhovel, to draw the eaſier out; but, for making eſſays of ingredients for Enamel, it muſt be a little blade of white Enamel, which ought to be provided purpoſely for that uſe.

The way to ENAMEL *gold.* We have already ſaid, that gold, ſilver, and red copper may be enamelled; now, to make true work, you muſt uſe only pure gold, becauſe ſilver makes white Enamel appear yellow, and copper riſes in ſcales, and makes vapours; for, though all Enamel ſticks to it, yet it is but very imperfectly, and may be eaſily divided and peeled off again; beſides, the colours are wretched on it, that they loſe much of their charm and luſtre by the impurity of that metal.

Therefore, if you would have good work, let gold only be your ſubject, and of the pureſt, if you employ clear Enamel; becauſe, on impure gold, they grow dull, and become imperfect; that is to ſay, there appears with this a certain obſcure and cloudy vapour in the Enamel, which deadens and takes away the life of its colour.

The gold plate ought to be riſing, and, when it is forged very even, the goldſmiths apply white Enamel over and under it, tho' it is to be wrought but on one ſide; but this is neceſſary for two reaſons; firſt, becauſe the work is neater and fairer for it; and again, becauſe, if it were only enamelled on one ſide, the fire would ſwell it, and ſo make it riſe, and that in bubbles; becauſe it is always as it were tormented, eſpecially when the pieces are great, and the Enamel careleſly laid on; this makes it produce bliſterings, which disfigure the work. The French chymiſts call ſuch vegeter, but their goldſmiths petits ouillets. This disfiguring of the work you may avoid, by laying Enamel on both ſides of the plate of gold, and thicker over than under. This will keep it equal and even on both ſides, the firſt lay of white Enamel,

mel, remaining ſmooth in this condition, ſerves for a field to place all your other colours on, as we will farther diſcourſe of in the art of portraying.

Oil of ſpike is uſed for diſſolving thick and opaque Enamel before it can be applied; for the tranſparent, you need uſe nothing but fair water, as we ſhall ſhew anon; and then it is couched flat and bordered with the metal, and ſometimes we do not border at all, the field being Enamel; but this is troubleſome, becauſe the limpid Enamels, as they melt, often mix, and ſo confound the colours, which conſtantly happens when the pieces are ſmall.

Red Enamels are not ſo, unleſs by chance, and come generally yellowiſh out of the fire; as ſoon as it is applied to the gold, it alters the colour; one may ſoon bring it to a perfect red Enamel, by turning it at the mouth of your furnace, when you are taking it out from the fire; and then it is that the workmen ſay they make it red, and give it its complete colour.

Gold, as we have already ſaid, admits of all ſorts of Enamel, clear or opaque, bright purple excepted, which is altered by the yellow colour of the gold, and does not take ſo good effect there as on ſilver, on which it ought ſtill to be uſed. The way of working every ſort of Enamel is alike.

To ENAMEL *on ſilver.* We have already taken notice that ſilver agrees not with all ſorts of Enamel, as gold. We repeat it here again, to prevent the uſe of any but ſuch as ſerve to produce perfect and agreeable effects.

You are to make leaſt uſe of white Enamel on ſilver, becauſe there it becomes yellowiſh and unpleaſing; but nothing can ſuit better with it than bright purple, green, blue, and egmarine, becauſe the whiteneſs of the ſilver is then clearly eminent, and gives its juſt ſplendor.

The work and manner of enamelling on ſilver is no way different from that of gold, in forging the plates evenly to prepare them for the Enamel; you may make uſe of white on the under ſide, ſince the Enamel there ſerves only to qualify the riſings and diſturbings of the metal in the furnace, which would cauſe unevenneſs, or diſagreements in the ſurface, and prevent its becoming juſt and handſome.

We need not repeat again that way of placing the Enamel on your plates of gold or ſilver, and ſo to put them into your little reverberatory furnace, ſpoken of before, to melt, and as ſoon as poliſhed to be taken from the fire.

To ENAMEL *on copper.* Though we have before touched upon the way of enameling on copper, yet, leſt the reader ſhould too ſlightly apprehend it, we ſhall therefore treat of it here to avoid imperfection.

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The leſs uſe is made of this metal in this work the better, for the Enamel never ſticks to it perfectly, but is eaſily ſcaled, divided, and broken off, which never happens to gold; beſides, the copper is ſo impure, that its fumes deſtroy the beauty of the Enamel ſo much in the furnace, that they quite loſe their charm and ſplendor by the malignity of thoſe vapours.

Though the copper receives eaſily all thick or dark Enamels, it cannot be brought ſo well to endure the clear and limpid; now, if you would make uſe of theſe laſt, you muſt firſt lay a lay of green or black, and thereon a leaf of ſilver to receive the Enamel ſuitable for that metal mentioned before; ſo that in the main it is much better to make uſe of ſilver for the tranſparent Enamels, ſince the copper is ſo apt to foul, and the change in either the ſame.

In enameling on copper, you muſt take a plate of red copper forged ſmooth and even, applying your Enamel of what colour you deſire above and under the plate as before; then put this into the reverberatory furnace, and, when it receives its poliſhing, draw it out.

To prepare the ENAMEL *for the metals.* Before you apply your Enamel on the metal, you muſt give it this little preparation, which is the eaſieſt, and beſt approved of by the goldſmith. We will inſtance it in white Enamel, becauſe that is more generally made uſe of than any other.

Take white Enamel, pulveriſe it very fine, pour on it a little aqua-fortis, and let it afterwards purify and refine in a ſmall glaſs cucurbit.

Waſh it afterwards often in fair water, dry and keep it in a cloſe veſſel for uſe.

To make uſe of it, firſt pound a quantity thereof in a ſtone mortar, wetting it with a little water, and ſo ſpread it on the plates, and into the furnace with it as before.

Thus do with all your clear and tranſparent Enamels, and you will have all your things in a readineſs to go on with your work as you think convenient.

To prepare the colours for painting on ENAMEL. Nothing can be more ſplendid than the paint on Enamel, and for this uſe muſt be choſen the livelieſt and moſt noble colours, and ſuch as will eaſily vitrify and melt.

All theſe before aſſigned are as equally ſufficient for this, as for enamelling; if you grind them firſt on your marble with the beſt oil of ſpike, or mix them together with the other ingredients for that purpoſe, as we ſhall give a fuller account hereafter, and of all the matters to be uſed with calcined Enamels, which ſerve to make up the paint for Enamel, mixing them well together, as painters do on their pallets. When you want ſome colours of

Enamel,

Enamel, you may, with blue and yellow, make a good fair green; a blue and red mixed will produce a fine violet; a red and white creates a roſe colour; a black and white forms a gallant grey, and ſo of others.

Every workman has his own ſecret and peculiar way of working; but moſt of them make uſe of rocaille for varniſhing their colours, which has an ill effect, becauſe of too much lead, which is not perfectly purged off. This leſſens the life and ſplendor, and it always continues as it were tarniſhed, cloudy, and dull.

But our Enamel, being well refined, will produce work ſo fine and agreeable, that it is not poſſible to find any thing ſo illuſtrious and accompliſhed; and ſuch as, for their own private diverſion, would work herein, and have not the conveniency of a glaſs-houſe, may be eaſily furniſhed, by proceeding to make one according to directions given. See the plate in the article FURNACE.

Notwithſtanding the ſufficiency of our Enamel for affording all ſorts of colours and tinges in painting on Enamel, we will yet preſcribe other means for this, no way inferior thereto, to anſwer the advantage and curioſity of thoſe who work at this excellent art.

To make white for painting on ENAMEL. The beſt workmen, for the moſt part, uſe the white Enamel ground, which they can manage with addreſs enough to heighten and illuſtrate their lights, which is neceſſary to be done to all their colours, as in miniature. But as it is difficult to preſerve the ground juſtly for improving thoſe other colours, and ordering the compoſitions, all one as in carnation, you muſt take of our cryſtal ground, prepared with tin and lead purged and refined as before-mentioned, or rather of our milk-colour Enamel, which is the faireſt can be made; cleanſe it with aqua-fortis; waſh, dry, and grind it afterwards with oil of ſpike.

Or you may prepare another white ground without lead, thus: Take very pure tin calcined, and let it vitrify in a glaſs-houſe pot, with eight times as much cryſtal frit, as we have directed the preparation before-mentioned. Pulveriſe theſe very fine, and proceed preciſely, according to preſcription for purification, &c.

To make a black for painting on ENAMEL. Though the black Enamels preſcribed before, and thoſe ſucceeding it, may ſerve to paint on Enamel with this colour, without any other preparation than grinding it with oil of ſpike; yet we will add here another black no leſs excellent and fine, ariſing from equal parts of black Enamel, and peregrine well calcined; mix, and reduce them to an impalpable powder, and then apply oil of ſpike, and

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you will have a colour which will take with great facility on the Enamels.

A yellow for paint on ENAMEL. We will only make uſe of our Enamel, prepared as before, mixed and purified with aqua-fortis, and after waſhed in clean water, as before-mentioned; dry and grind this powder with oil of ſpike on your marble, and it is fit for uſe. With this yellow and blue, as we have already hinted, may be made a fair green; but thoſe Enamels deſcribed before are ſo juſt and fine, that it is needleſs to uſe any other for that purpoſe. This preparation for the yellow, here laid down, is ſufficient alſo for it, without any farther trouble.

A blue to paint on ENAMEL. The Enamels of this colour, aſſigned before, are the nobleſt can be uſed in this work; purify them with aqua-fortis, and grind them with oil of ſpike, as before directed for the other colours.

You may, becauſe it is vitrified, make another blue fine enough, thus: Take painters Enamel prepared; add to this, put into a glaſs bottle, beſt rectified aqua vitæ, enough to drown the ſtuff by four inches; ſtop it well, and ſet it in the ſun-ſhine five or ſix days, ſhaking the bottle well three or four times a day, that the purer Enamel may diſſolve, and the groſſer fall to the bottom. Take the Enamel out of your bottle and ſteep the fæces, letting them precipitate as uſeleſs; then evaporate your aqua vitæ and dry your azure, which will be a very fine well cleanſed matter for all ſorts of this work; grind it after on your marble. This Enamel ſo prepared is moſt proper for painting, and far beyond the ultramarine ſo much uſed.

A red paint for ENAMEL. There can nothing exceed the perfection of our Enamels of this colour, taught in eight ſeveral articles before-mentioned; the like may be ſaid of our blood colour, rubies, roſe, and carbuncle, which is the moſt exalted ingredient for enamelling metal, or making paint on Enamel; and thoſe, who practiſe this fine art, uſe no other than that of the glaſs-houſe, or ſuch as they make accordingly. Now, this red Enamel is prepared as the other colours with aqua-fortis to purify it, waſhed, dried, and ground with oil of ſpike for your uſe.

There is yet another tolerable red, which they paint with on Enamel, in which is employed calcined gold; but this would be much more improved, if, inſtead of their rocaille, they made uſe of our matter made of cryſtal and ſaturnus glorificatus, or of our principal prepared powder before preſcribed; for theſe are exceedingly well purified, whereas the rocaille has too great a ſurcharge of lead, the impurity whereof always renders the work defective.

One takes an ounce of fine gold in very thin plates, theſe diſſolved in eight ounces of aqua-fortis, and regulated with ſal armoniac,

armoniac, or old ſtrong ſalt, in a ſmall glaſs matraſs; this is put into a glaſs cucurbit, wherein were already poured eight Paris pints of ſpring water, and ſix ounces of mercury; the cucurbit is placed on a ſtill fire, and, after twenty-four hours, the gold deſcends to the bottom in a light land-red powder; then the water is poured off leiſurely into an earthen glazed receiver, or pan, and the powder gathered and dried by a moderate heat, and with a ſhamois ſkin they ſeparate the mercury from the gold, and grind this powder with twice its weight of flowers of ſulphur together; and then put all into a crucible over a ſmall fire, where the ſulphur will communicate itſelf with the reſt, and then evaporating, they find the powder ſomewhat ruddy, which, ground with rocaille, is what they make uſe of on the Enamel.

We own this calcination to be tolerable as to the gold; but, as for mixing the calx with the rocaille, without melting them together to incorporate, it is diſputable. We believe that, in grinding them together with oil of ſpike, they may, in ſome ſort, incorporate as other colours, but can never ſo perfectly unite; beſides, the cryſtal matter does not ſo well receive the colour of the gold this way, as if it were done by fuſion.

Others make red inclining to vermilion, which they uſe in painting, after this manner: Take vitriol, calcined in two crucibles well luted together, and ſet for an hour over a ſlow fire; then purge it with aqua-fortis, waſh it in fair water, and grind it with oil of ſpike as before, and ſo make uſe of it for Enamel.

All red Enamel which is good, ought to be hard, and not eaſily conſumed in the fire; for that which is otherwiſe, contains much lead, and ſoon becomes dull and ſullied, and is not of ſo laſting a ſubſtance, which the workmen ought to be cautious of.

To finiſh the preparation of Enamel, and before the manner of painting them is preſcribed, obſerve, that all the colours before-mentioned, which are not pure Enamel, ought to be incorporated with a cryſtalline matter, ſuch as we have preſcribed, to the end they may vitrify the better, which elſe they will not eaſily do; though moſt workmen make uſe of their rocaille, whether to avoid the trouble of making, or that they are ignorant how to prepare, a better matter; and this has obliged us to give ſeveral ways very good and true for this purpoſe to make fine and perfect work by.

The way to paint on ENAMEL. This art is revered by all nations; it is ſo fine and ſo excellent, that the firſt and nobleſt perſons in the world practiſe it, as we have ſaid elſewhere. It is certain that the art of painting on Enamel is modern, but no leſs eſtimable for that, ſince its effects are ſo wonderfully beautiful,

ſo

ſo infinitely laſting, of ſo natural a gloſs, and their ſplendor never to be defaced.

If it were poſſible to make large works of Enamel, as is done in pictures, they would be ineſtimable becauſe of their luſtre, and ſo far ſurpaſs what antiquity has had ſuch great reſpect for, and which theſe latter ages ſtill careſs with extraordinary eſteem.

This way of painting on Enamel ſeems much more difficult than limning; practice however convinces us, that they are equally eaſy, and we can with as little trouble repreſent hiſtory on Enamel, as in limning; the difference lies only in preparing the colours, which is not done the ſame way; for we dry and varniſh our Enamel paint by fire, whereas that in limning is done by the air.

To paint on Enamel, you muſt have a plate of gold enameled with white, on which delineate and portray your deſign. This done, draw it over again in dark red; the piece being perfectly done off, and the lines complete to the ſubject, ſet the tablet, or piece in the muffle, on a reverberatory fire, to ſettle as before directed.

Your tablet being taken out, apply the colours in a juſt order as in limning, with this difference only, that here you make your white ground ſerve for filling, where that colour is required to ſet off the heightenings and luſtre of the lights, as is done in miniature; and becauſe it mightily contributes to the heightening thereof in the other colours as to improving their lights, according to the directions before-mentioned.

When the piece is thus finiſhed, put it again into the furnace, to fix the colours; and as ſoon as you perceive it varniſh or poliſh, draw it out, leſt the colours mix and ſpoil each other.

You may take out the work again, and reviſe it as often as you pleaſe, only putting it ſtill into the furnace, until it receives its juſt gloſs, &c.

This way of renewing and reviſing the tables is done in limning with oil; and the painters obſerve, that the pieces muſt not be handled until they are well dried in the air; ſo thoſe in Enamel muſt be let alone until they receive their perfection from the fire.

This is all to be obſerved in painting on Enamel; it remains only for us to ſhew how to prepare your dark red for tracing the deſign; you may have it thus:

Take the caput mortuum which remains in the retort, after the aqua-fortis is made of your vitriol and nitre; grind it with oil of ſpike, and ſo you have the dark red ready for your uſe; or you may make it with crocus martis, ground with oil of ſpike.

The END. The ſcope whereunto all operations are directed, is repreſented, in painting, by an old decrepit man with a grey

beard, adorned with a garland of ivy; ſitting with a ſun departing from the eaſt, and ſeems to be in the weſt by its rays; holds a pyramid with 10 M S on it, and a ſquare with the letter Omega.—Decrepit, becauſe he has one foot in the grave; the ivy denotes his want of ſupport; the Omega declares the end, as Alpha does the beginning; the 10 M S ſignify 10,000.

ENGRAVING, } is the art or act of cutting metals and pre-
GRAVING, } cious ſtones, and repreſenting letters, figures, &c. on them; Engraving is an art which teaches the way of transferring any deſign upon copper, braſs, or wood, by means of ſharp-pointed inſtruments.

Engraving is properly a branch of ſculpture, and is divided into ſeveral branches, according to the matters it is practiſed upon, and the manner of performing it.

The original way of Engraving on wood is now diſtinguiſhed by the name of cutting in wood; that on ſtones for tombs, &c. carving or ſtone-cutting; that performed on metals with aqua-fortis is called etching; and that performed with the graver on medals, as copper, braſs, ſteel, ſilver, &c. as alſo on precious ſtones, cryſtal, &c. alone, keep their primitive name of Engraving; and that performed by the knife, burniſher, punch, and ſcraper, is called metzo tinto.

The art of Engraving is, for the greateſt part, of modern invention, not being older than the ſixteenth century.

It is true indeed, the ancients did practiſe Engraving on precious ſtones and cryſtals; ſome of which works are ſtill to be ſeen, equal to any production of the latter ages; but the art of Engraving on plates of metal or blocks of wood in order to form prints from them, was not known till after the invention of painting in oil.

The diſcovery of this art is aſcribed to Maſo Finiguerra, a goldſmith of Florence, who, being accuſtomed to take impreſſions of every thing he cut in clay, and to caſt melted ſulphur into this mould, at length found out the way of taking the impreſſions of them on paper, by ſmearing the figures of ſulphur with oil and lamp-black.

The ſecret was not long before it got abroad, and, coming to the hands of Albert Durer and Lucas, they greatly improved it, and began to engrave on wood and copper, and ſucceeded to admiration.

ENGRAVING *in copper*, is employed in repreſenting divers ſubjects, as portraits, hiſtories, landſcapes, foliages, figures, buildings, &c. either after paintings or deſigns made for the purpoſe. This is performed either with the graver or aqua-fortis; as for the graver, you muſt procure a copper-plate, according to the ſize of the thing you would engrave on it; this plate muſt be well poliſhed;

poliſhed; then having your deſign drawn or traced over in looſe, i. e. ungummed ink, warm the plate over the fire and ſmear it lightly over with a thin ſkin of virgin-wax, and on this lay the draught or deſign, done with ungummed ink, or red chalk, or black lead, &c. and rub it hard down, that the wax may lay hold of it and take it off.

Having thus transferred the deſign upon the wax, it is to be traced through the wax upon the copper with a point or needle; then you muſt heat the plate over the fire, and wipe off all the wax, and the ſtrokes drawn on it with the needle, &c. will remain; which are to be followed, heightened, &c. according to the tenor of the deſign, with the graver, which ought to be well tempered, and very ſharp.

All the art conſiſts in the conducting or guiding the graver, which depends not ſo much upon rules as practice, the habitude, diſpoſition, and genius of the artiſt.

The inſtruments neceſſary for this performance, are a round cuſhion or ſand-bag, made of leather to lay the plate on, to give it the neceſſary turns and motions; a burniſher, made of iron or ſteel, round at one end, and uſually flattiſh at the other, to rub out ſlips and failures, ſoften the ſtrokes, &c. a ſcraper, to pare off the ſurface on occaſion; and a rubber of black hat or cloth, rolled up to fill up the ſtrokes, that they may appear the more viſible, in order to know how the work proceeds.

1. The chief inſtruments uſed in graving, are four; 1. Gravers. 2. An oil-ſtone. 3. A cuſhion. 4. A burniſher.

2. Gravers or graving tools are of three ſorts, round-pointed, ſquare-pointed, and lozenge. See plate XIV, fig. 1, 2.

The round are the beſt for ſcratching withal; the ſquare-pointed ones are for cutting the largeſt ſtrokes; and the lozenge-pointed ones, for the moſt fine and delicate ſtrokes; but the graver of a middle form, between the ſquare and lozenge-pointed, will make the ſtrokes or hatches appear with more life and vigour, according as it is managed in working.

3. The oil-ſtone is for whetting the gravers upon; this ought to be very ſmooth, but not too hard, and without pin-holes.

This is uſed as follows; having put a few drops of clean olive oil upon the ſtone, lay that ſide of the graver, that you deſign ſhall cut the copper, flat upon the ſtone; whet it very flat and even; and for that purpoſe you muſt take care to carry your hand ſtedfaſt, with an equal ſtrength, placing the fore-finger firmly upon the oppoſite ſide of the graver.

Then turn the next ſide of the graver, and whet that in the like manner, that you may have a very ſharp edge for an inch or more.

Then turn that edge that you have whetted uppermoſt, and,

ſetting the end of the graver obliquely upon the ſtone, whet it very flat and ſloping, in the form of a lozenge, with an exact and even hand, making a ſharp point to the edge of it.

If the graver be not very good, and very exactly and carefully whetted, it will be impoſſible to perform the graving with niceneſs and curioſity.

5. The graving cuſhion is a roundiſh, but flattiſh leather bag filled with ſand to lay the plate upon, on which it may be turned eaſily any way at pleaſure.

The plate muſt be turned with the left-hand, according as the ſtrokes which you are Engraving turn; this is to be attained by practice and diligent care.

6. The burniſher, which is an iron tool, is uſed in rubbing out ſcratches, ſpecks, or other things, which may cauſe faults in your work on the plate; and, alſo, if any ſtrokes ſhall happen to be cut too deep or groſs, to make them appear leſs and fainter by rubbing them with it.

Of the making of gravers. 1. You muſt be provided with ſome croſs-bow ſteel, and procure it to be beaten out into ſmall rods, and ſoftened; and, this being done, you may, with a good file, ſhape them as you pleaſe; this being done, heat them red-hot, and immediately dip them into ſoap, which will render them very hard.

2. In doing this obſerve, that in dipping them into the ſoap, if you turn your hand never ſo little away, the graver will be crooked.

3. If the graver prove too hard, lay the end of it upon a red-hot charcoal, till it begins to grow yellowiſh, and afterwards dip it in tallow, or, as ſome ſay, in water, and it will toughen it.

4. Then, having ſharpened the graver, ſtrike the point of it into a piece of hard box wood, to take off all the roughneſs about the points, which was cauſed by whetting it upon the oil-ſtone.

5. In the laſt place, touch the edge of the graver with a file; if the file cut it, it is too ſoft, and will not work; but, if it will not touch it, it is fit for the work.

If the graver breaks on the point, it is a ſign that it is tempered too hard; but, will oftentimes, after a little uſe by whetting, come to be well conditioned.

Of poliſhing the copper-plate. 1. Take a copper-plate about the ſize of your work, that is to be engraven on it, and that is free from fire flaws.

2. Hammer it very even and ſmooth on a ſmooth anvil; then take a pumice-ſtone, free from gravel, leſt it ſcratch it, and thereby cauſe a great deal of labour to get out the ſcratches, with a little water.

Fig. 2.



Fig. 1.



Fig. 3.

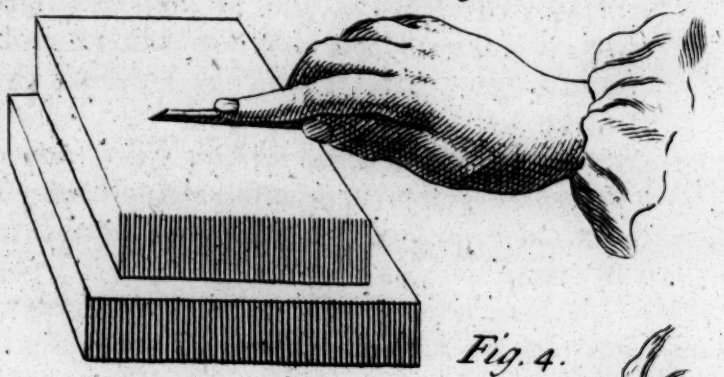


Fig. 4.

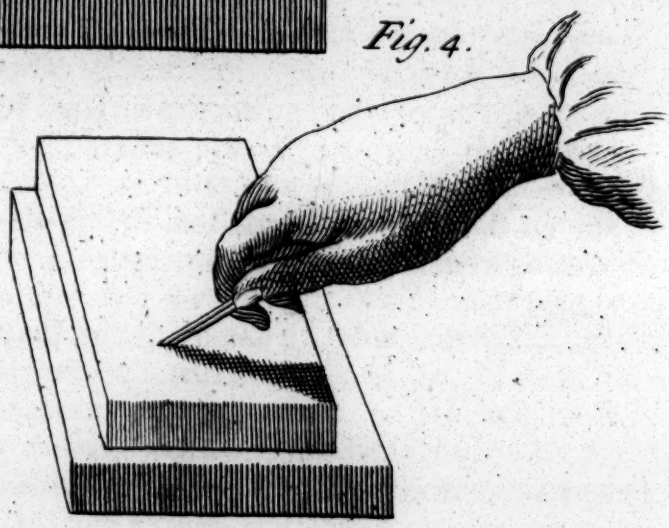
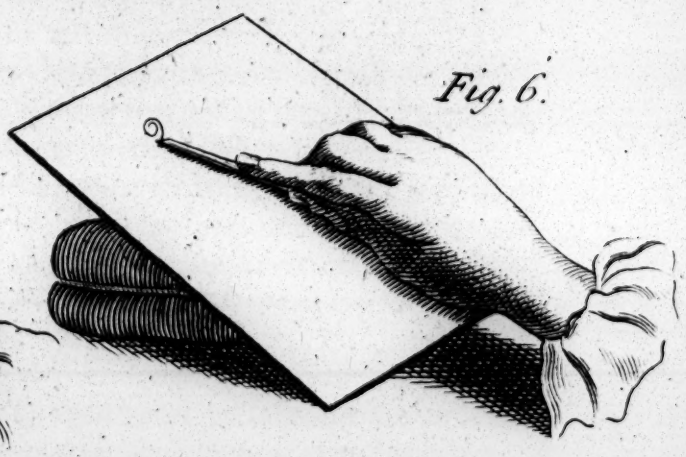


Fig. 5.



Fig. 6.



3. Then drop a few drops of olive oil upon the plate, and burniſh it with your burniſhing iron, and afterwards rub it well with the end of a piece of charcoal, made of beech-wood and quenched in urine, dipped in water.

4. With a roller made with black felt, caſtor, or bever hat, dipped in olive oil, rub it well for an hour or more, and your plate will be ſufficiently poliſhed.

Of the manner of holding the graver. 1. It will be proper to cut off that part of the knob of the handle of the graver, which is upon the ſame line with the edge of the graver; by this means, making the lower ſide that is held next to the plate flat, that it may not be any interruption in the graving. See plate XIV. fig. 3, 4, 5, 6.

2. For, if you work upon a large plate, if that part of the handle of the graver be not cut away, it will ſo reſt upon the copper, that it will interrupt the ſmooth and even motion of your hand in making the ſtrokes; and will cauſe the graver to run into the copper deeper than it ought to do.

3. Place the knob at the end of the handle of your Graver in the hollow of your hand, and having extended your fore-finger towards the point of the graver, laying it at the top or oppoſite to the edge, which is to cut the plate; place your thumb on the one ſide the graver, and your other fingers on the other ſide, ſo as that you may guide the graver flat and parallel with the plate.

4. Take care that your fingers interpoſe not between the plate and the graver, for they will be an hindrance in carrying your graver level with the plate, and make the lines more deep, groſs, and rugged than you would have them.

Of the way and manner of ENGRAVING. 1. Having, as has been ſaid before, a cuſhion filled with ſand about nine or ten inches diameter, and three or four inches thick, and a plate well poliſhed, lay the plate upon the cuſhion, being placed on a firm bench or table. See plate XI^r. fig. 6.

2. Holding the graver, as before directed, in making ſtraight ſtrokes, take care to hold the plate firm upon the cuſhion; move your hand, leaning lightly, where the ſtroke ſhould be fine, and heavier where the ſtroke ſhould be broader.

3. In making crooked or circular ſtrokes, hold the hand and graver ſtedfaſt, your arm and elbow reſting upon the table, and move the plate againſt the graver; for otherwiſe it is impoſſible to make thoſe crooked or winding ſtrokes with that command and neatneſs that you ſhould do.

4. Take care to carry your hand with ſuch a ſlight, that the ſtroke may end as finely as it began; and, if there be occaſion to thicken and make one part deeper or blacker than another, it ſhould be done by degrees; and, that you may do it with the

greater exactneſs, obſerve, that your ſtrokes be neither too cloſe nor too wide.

For your more exact obſervation, you ſhould practiſe by ſuch prints as are more looſely ſhadowed, leſt, by imitating the more dark, you ſhould not know where to begin or where to end.

5. After you have engraven one part of your work, it will be proper to ſcrape it with the ſharp edge of your burniſher or other graver, carrying it along even with the plate, to take off the roughneſs of the ſtrokes; but, in doing this, you muſt take great care not to make ſcratches in it.

6. And, that you may the better diſcern that which is engraven, dip your roller, made of felt or caſtor, in oil, and rub the places engraven.

Laſtly, whatſoever ſhall appear to be amiſs, you muſt rub out with the burniſher, and poliſh it again very nicely with your rubber of caſtor and oil; and, when you have done, you may boil your plate a little while in vinegar, and rub it gently with your rubber before-mentioned.

The method of ENGRAVING *copies or prints.* 1. If you would have it print the contrary way, rub the backſide of the print with duſt of black lead, and lay it on the waxed plate; and trace over all the outlines of the deſign or print with a needle, or drawing-point, and you will find all thoſe lines on the wax.

2. Take a drawing-point, not very ſharp, and with the point thereof ſcratch or trace over every particular line or out-ſtroke; which, when you have done, it will not be difficult to mark out all the ſhadows as you engrave, having the proportion before you.

3. For copies of letters go over every letter with black lead, or write them with ungummed ink, and clap the paper on the waxed plate as before directed.

4. Or take a dog's tooth and rub the paper all over with it, not miſſing any place; which done, take the paper off the plate, and ſo will all the letters written with the ungummed ink be left exactly upon the wax.

5. Then take a ſtift, and draw all the letters through the wax upon the plate, and take a linen rag or pencil bruſh, and cleanſe the work from the looſe wax; ſo will all the letters be drawn upon the copper.

Of the imitation of copies or prints for ENGRAVING. 1. Having a piece of bees-wax tied up in a fine holland rag, heat the plate over the fire, till it may be hot enough to melt the wax; then rub the plate with the wax tied up in the rag, till you ſee it covered all over with wax, which let be very thin; if it be not even, heat it again by the fire and wipe it over gently with a feather.

2. If you would copy a printed picture, to have it print off the

the ſame way, clap the print which you would imitate with the printed ſide next to the plate, and, having placed it very exactly, rub the backſide of the print with a burniſher, or any thing that is hard, ſmooth, and round, which will cauſe it to ſtick to the wax upon the plate; then take off the print, beginning at one corner, gently and with care, leſt you tear it, which may be cauſed alſo by putting too much wax upon the plate, and it will leave upon the wax the perfect proportion in every part.

If the print ſtick too hard to the wax, hold it to the fire, and it will come off with eaſe.

Where take notice, that, if it be an old picture, before you lay it upon the wax it will be beſt to trace it over in every limb with a black lead pencil.

ENGRAVING *on precious ſtones*, conſiſts in repreſenting figures or devices, either in relievo or creux, i. e. emboſſed or indented on divers kinds of hard poliſhed ſtones.

The art of Engraving on precious ſtones is one of thoſe in which the ancients excelled; as it appears by thoſe antique agates, cornelians, and onyxes, which ſurpaſs any thing of that kind the moderns have produced.

Pyrgoteles, among the Greeks, and Dioſcorides, under the firſt emperors of Rome, were the moſt eminent engravers we read of; the former of which was ſo eſteemed by Alexander, that he forbad any body elſe to engrave his head; and the head of Auguſtus, engraven by the latter, was ſo beautiful, that the ſucceeding emperors choſe it for their ſeal.

All the polite arts having been buried under the ruins of the Roman empire, the art of Engraving on ſtones met the ſame fate, and was not retrieved in Italy, till the beginning of the fifteenth century; when one John of Florence, and after him Dominic of Milan, performed works of this kind no way to be deſpiſed.

After their time, ſuch ſculptures became more common in Europe, and particularly in Germany, from whence a great many were carried into other countries; but theſe fell far ſhort of the beauty of thoſe of the ancients, eſpecially ſuch as were on precious ſtones; for, as to thoſe on cryſtal, the Germans ſucceeded well enough; as alſo did the French after them.

In this branch of Engraving, the things made uſe of are the diamond or emery.

The diamond, which is the hardeſt and moſt perfect of all precious ſtones, is only cut by itſelf, or with its own matter.

That which is firſt to be done, is to cement two rough diamonds to the ends of two ſticks, big enough to hold them ſteady in the hands; and to rub or grind them againſt each other, till they be brought to the form deſired.

The duſt or powder that is rubbed off, ſerves afterwards to poliſh them, which is performed with a kind of mill that turns a wheel of ſoft iron.

The diamond is fixed in a braſs diſh, and, thus applied to the wheel, is covered with diamond duſt, mixed up with oil of olives; and, when the diamond is to be cut facet-wiſe, they apply firſt one face, then another, to the wheel.

Rubies, ſapphires, and topazes, are cut and formed the ſame way, on a copper wheel, and poliſhed with tripoli diluted in water.

As to agates, amethyſts, emeralds, hyacinths, granates, rubies, ſapphires, and other of the ſofter ſtones, they are cut on a leaden wheel, moiſtened with emery and water, and poliſhed with tripoli on a pewter wheel.

Lapis, opal, &c. are poliſhed on a wooden wheel.

To faſhion and engrave vaſes of agate, cryſtal, lapis, or the like, they make uſe of a kind of lathe like that uſed by pewterers, excepting that as the pewterers lathe holds the veſſels, which are to be wrought with proper tools; that of the engraver generally holds the tools which are turned by a wheel, and the veſſels held to them to be cut and engraven, either in relievo or otherwiſe; the tools being moiſtened from time to time with diamond duſt and oil, or at leaſt emery and water.

To engrave the ſmaller works of any of theſe ſtones, after they have been poliſhed, ſuch as ſeals, &c. they uſe a little iron wheel, the ends of whoſe axes are received within two pieces of iron placed upright, as in the turners lathe; to be brought cloſer or ſet further apart at pleaſure.

At one end of one of thoſe axes are fitted the proper tools, being kept tight by a ſcrew.

Laſtly, the wheel is turned by the foot, and the ſtone applied by the hand to the tool, and is ſhifted and conducted as occaſion requires.

The tools are generally of iron, ſometimes of braſs. As to their form, it is various, but generally bears ſome reſemblance to chiſſels, gouges, &c. ſome have ſmall round heads like buttons, others like ferrels to take the pieces out, others flat, &c.

Theſe tools are not applied directly againſt the ſtone, but as it were ſideways, thus wearing, and, as it were, grinding off the ſubſtance.

And ſtill, whether it be figures, letters, or characters, the manner of application is the ſame.

The tools, as has been before ſaid, are to be frequently moiſtened with diamond duſt and oil of olives.

When the ſtone has been engraven, it is poliſhed on wheels of bruſhes made of hogs briſtles and tripoli.

As for works which are larger and leſs delicate, they make uſe

uſe of tools of copper or pewter, made on purpoſe to poliſh the ground, or plain parts, with tripoli, &c. which is applied after the ſame manner, as thoſe wherewith the Engraving is performed.

ENGRAVING *on ſteel* is chiefly employed in cutting ſeals, punches, matrices, and dies proper for ſtriking coins, medals, and counters.

The methods of Engraving with the inſtruments, &c. are the ſame for coins as for medals and counters; all the difference conſiſts in their greater or leſs relievo; the relievo of coins being much leſs conſiderable than that of medals, and that of counters ſtill leſs than that of coins.

Engravers in ſteel commonly begin with punches, which are in relievo, and ſerve for making the creux or cavities of the matrices and dies.

Though ſometimes they begin with the creux or hollowneſs; but then it is only when the intended work is to be cut very ſhallow.

The firſt thing is the deſigning the figures; the next is the moulding them in white wax, of the ſize and depth they are to be; and from this wax the punch is engraven.

This punch is a piece of ſteel, or at leaſt of iron and ſteel mixed, on which the intended figure, whether a head or a reverſe, is cut or chiſſelled in relievo, before the metal is tempered or hardened.

The inſtruments uſed in this graving in relievo, which are much the ſame as thoſe wherewith the finiſhing the work in creux is effected, are of ſteel.

The principal are gravers of divers kinds, chiſſels, flatters, &c.

When the punch is finiſhed, they give it a very high temper, that it may the better bear the blows of the hammer with which it is ſtruck, to give the impreſſion to the matrice.

That which engravers call matrice or matrix, is a piece of good ſteel of a cubical form, called alſo a die, on which the relievo of the punch is ſtruck in creux.

It is called matrix, becauſe the coins or medals ſeem to be formed or generated in the cavities or indentures thereof, as animals are in the matrix of their mother.

This ſteel is made hot to ſoften it, that it may the more readily take the impreſſion of the punch; and, after ſtriking the punch on it in this ſtate, they proceed to touch up or finiſh the ſtrokes and lines, where, by reaſon of their fineneſs, or the too great relievo, they are any thing defective, with ſome of the tools above-mentioned.

The figure being thus finiſhed, they proceed to engrave the

reſt

reſt of the medal, as the mouldings of the border, the ingrailed ring, the letters, &c.

All which, particularly the letters or ingrailment, are performed with little ſteel punches, well tempered and very ſharp: And, as they ſometimes make uſe of puncheons to engrave the creux of the matrix, ſo on ſome occaſions they make uſe of the creux of the matrix to engrave the relievo of the punch.

To examine and judge of the Engraving in creux, divers methods have been deviſed to take the impreſſions from it, as the work proceeds.

Sometimes they make uſe of a compoſition of common wax, turpentine, and lamp-black, which, always retaining its ſoftneſs, eaſily takes the impreſſion of the part it is applied to.

But, as this only ſerves to ſhew the work by piece-meal, they have recourſe to other methods to ſhew the whole figure.

The firſt is by pouring melted lead on a piece of paper, and clapping the matrice upon it; the ſecond is with melted ſulphur managed the ſame way; the third is by laying a piece of ſoft paper on the graving, and over the paper a leaf of lead, when, giving two or three blows with a hammer on the lead, the paper takes the impreſſion of the work: But this is only proper where the Engraving is ſhallow.

When the matrix is quite finiſhed, they temper it, rub it well with pumice-ſtone, and clean out the ſtone again with a hair bruſh; and, laſtly, it is poliſhed with oil of emery: In this condition it is fit for the mill, to be uſed to ſtrike coins, medals, &c.

Engraving on ſeals, ſtamps, puncheons, marking-irons for goldſmiths, pewterers, book-binders, &c. either in relievo or indenture, is performed after the manner laſt deſcribed.

ENGRAVING *in relievo or in concave.* There are ſeveral ways of Engraving on metals and upon precious ſtones; for relievo's are made both in the one and the other, as well as graving in concave.

When an artiſt would engrave on ſteel to make medals, he begins with deſigning his ſubject, whether an effigy or device, which he cuts out on wax in baſſo-relievo; then he makes a puncheon, and on one of theſe ends, which ought to be of caſe-hardened ſteel, he cuts out of relief the ſame thing he made in wax.

When the puncheon is in its perfection, he tempers it to harden it, and then, with a mallet or ſome ſuch inſtrument, ſtrikes upon it to make the impreſſion in a ſquared piece of ſteel formed like a die; before which, he puts the ſquared piece into the fire to ſoften it, and make it more eaſily receive the impreſſion with the puncheon; for, being ſtruck hot and cold, it receives in concave what is in relievo on one end of the puncheon.

The

The ſquared piece not taking all the delicate ſtrokes of the puncheon, which commonly is uſed for the raiſing of the relievo, there is a great deal more to be done to finiſh the concave, which is performed with ſteel tools, as little chiſſels, burins, ſharp gravers, echops, riffloirs, little chiſſels with files at the end, and ſeveral other tools, ſome to cut, ſome to hew, ſome ſtraight, ſome crooked, which the artificer provides himſelf with, and tempers and rubs on a pumice-ſtone.

As the puncheon is made uſe of, it is from time to time bruſhed with a ſort of braſs wire.

When the figures are finiſhed, he engraves the reſt of the medal, as the moulding of the borders, the letters, &c. for which he uſes the tracer, the ingrailer, and other puncheons well ſteeled and tempered; thoſe that are uſed for the mouldings and letters, are ſtruck and impreſſed on the puncheon with a hammer; for neither the burin nor the little chiſſel can engrave letters to the ſame perfection as theſe puncheons.

There are abundance of other little things neceſſary to be done in medals, according to the nature of the deſign, which muſt be ſtruck alſo as well as the letters.

As for the little chiſſels, they are to be touched lightly with a mallet, more or leſs as the work requires.

To write or engrave upon an egg, pebble, flint, &c. Write what you pleaſe with wax or greaſe upon an egg, pebble, flint, &c. then put it into the ſtrongeſt ſpirit of vinegar or ſpirit of ſalt, letting it lie two or three days, and you will find every place about the letters or writing eaten or conſumed away; but the places, where the wax or greaſe was, not touched at all.

ENVY, is repreſented by a wonderful lean old man, with a pale and meagre face, in whoſe withered cheeks age has wrought deep furrows and wrinkles.

EQUALITY, is repreſented, in painting, by a middle-aged woman, holding a pair of ſcales in her right hand, and the neſt of a ſwallow feeding her young ones in her left.—The ſcales denote Juſtice duly weighing actions; the ſwallow, the father of a family dividing his eſtate equally among his children, imitating the ſwallow, that never takes from one to give to another.

EQUALITY, is alſo repreſented, in painting, by a lady, lighting two torches at once.

ERATO, takes her name from ἔρος, love or deſire; ſhe is one of the nine muſes, and is painted with a ſweet and comely countenance, her temples encompaſſed with myrtles and roſes, bearing a heart with an iron key; by her ſide, Cupid winged with a lighted torch, having his bow and quiver at his back.

ERROR, is repreſented, in painting, by a man in a pilgrim's habit, groping out his way blindfold.—The cloth blinding him

ſignifies

ſignifies a man's falling into Error, when his mind is darkened with worldly concerns; the ſtaff, his being apt to ſtumble, if he take not the guide of the ſpirit and of right reaſon.

ESTEEM, cannot be repreſented, in drawing, &c. but by attention, and by the motion of the parts of the face, which ſeem fixed upon the object cauſing this attention; for then the eye-brows will appear advanced forward over the eyes, being depreſſed next the noſe, and the other ends a little riſing, the eye very open, and the eye-ball turned upwards. The veins and muſcles of the front, and about the eyes, will appear a little ſwelled, the noſtrils drawing downwards; the cheeks will be moderately ſunk in about the jaws, the mouth a little open, the corners drawing back and hanging downwards. See plate III.

ETCHING, is a method of engraving on copper, in which the lines or ſtrokes, inſtead of being cut with a tool or graver, are eaten in with aqua-fortis.

The invention of Etching, properly ſo called, was much about the ſame time as engraving on copper, by Albert Durer and Lucas.

Etching has ſeveral advantages over graving; as, firſt, that it is done with more eaſe and expedition; ſecondly, that it requires fewer inſtruments; and, thirdly, that it repreſents divers kinds of ſubjects better and more agreeably to nature, as landſcapes, ruins, grounds, and ſmall, faint, looſe, remote objects, buildings, &c.

The method of Etching is as follows: The copper-plate being prepared, well hammered, and poliſhed as for engraving, then ſcrape ſome chalk, and, with a clean linen rag, rub it well over the plate, to free it from greaſe; heat it over the fire, and, when hot, cover it over with a peculiar ground or varniſh.

When this ground or varniſh is laid on, it is blackened with the ſmoke of a candle; and on this varniſh or ground, thus blackened, the back of the deſign or draught is laid, being firſt rubbed over with red chalk.

This deſign, being laid on, is to be calked or transferred upon the varniſhed ſide of the plate; this is done by tracing over all the lines or ſtrokes of the draught, with a needle or point, not very ſharp, which, preſſing the paper cloſe down to the ground, cauſes the wax to lay hold of the red chalk, and ſo brings off with it the marks of the ſeveral lines; ſo that, at length, it ſhews a copy of the whole deſign in all its correctneſs.

The draught or deſign being thus calked, the etcher next proceeds to draw the ſeveral lines and contours, with a pointed tool, through the grounds of the copper.

In doing this, he makes uſe of points of divers ſizes, and preſſes on them more ſtrongly or lightly, according as the ſeveral parts

of

of the figures, &c. require more or leſs ſtrength or boldneſs.

Some of theſe points are as fine as needles, for the tender hair ſtrokes, and the remoter fainter objects; and others again as big as bodkins, made oval-wiſe, for the deeper ſhadows, and the figures in the front of the work.

This being done, a rim or border of wax is raiſed round the circumference of the plate, which is to prevent the aqua-fortis from running off at the edges; and then it is poured on the plate ſo prepared.

The ground or varniſh, with which the plate is covered, being impenetrable by the corroſive quality of the aqua-fortis, defends the plate from it every-where, but in thoſe lines or hatches cut through it with the points; which lying open, the water paſſes through them into the copper, and eats into it the depth required; which being done, it is poured off again.

It is to be obſerved, there are two kinds of Etching grounds, the one ſoft and the other hard.

There are likewiſe two kinds of aqua-fortis, the one white, which is only uſed with the ſoft ground, and is applied as has been before directed; and the other green, made of vinegar, common ſalt, ſal armoniac, and verdigreaſe.

This is uſed indifferently with either kind of ground.

The application of the green is ſomewhat different from the white.

This is poured on the plate, without any border, which alſo is placed a little inclined to the end, that the water may run off, which is received in a veſſel placed underneath.

This pouring on of the aqua-fortis is ſeveral times repeated, till it has eaten deep enough.

Nor muſt the aqua-fortis, of which kind ſoever it is, continue equally long, or be poured on equally often on all the parts of the deſign; the remote parts muſt be eaten more ſlightly than thoſe nearer to the view.

For effecting this, they make uſe of a compoſition of oil and greaſe, with which they cover the parts that are to be bitten no farther.

Or elſe they lay this compoſition on, as a defenſative at firſt, and take it off again, when they find it proper.

In a word, they are every now and then covering or uncovering one or another part of the deſign, as occaſion requires.

The management of the aqua-fortis is the principal thing in the whole art of Etching, and that on which the effect of the whole very much depends.

The workman muſt be very obſervant as to the ground, that it do not fail or give way in any part to the aqua-fortis; and if it does, in any place, to ſtop up that place with common varniſh.

This

This muſt alſo be obſerved, that a freſh dip of aqua-fortis muſt never be given, without firſt waſhing out the plate in fair water, and drying it at the fire.

When the aqua-fortis has performed its part, the ground muſt be taken off, and the plate waſhed and dried; after which, the artiſt muſt examine it, with his graver in his hand, to touch it up and heighten it, where the aqua-fortis, &c. has miſſed.

ETCHING; *the materials uſed therein.* Etching is an artificial engraving on copper or braſs plates with aqua-fortis.

The inſtruments uſed in Etching are thirteen:

1. Hard varniſh. 2. Soft varniſh. 3. Prepared oil. 4. Aqua-fortis. 5. Needles. 6. Oil-ſtone. 7. Bruſh pencils. 8. A burniſher. 9. A ſcraper. 10. Compaſſes. 11. A ruler. 12. A ſtift. 13. The frame and trough.

Etching needles. Chuſe needles of ſeveral ſizes, ſuch as will break without bending, and of a fine grain; then take good round ſticks of firm wood, that is not apt to ſplit, in length about ſix inches, and about the thickneſs of a large gooſe quill, at the end of which fix your needles, ſo that they may ſtand out of the ſticks about a quarter of an inch, or ſomething better. Of theſe needles you ought to have twenty at leaſt; which you may alſo fix in ſuch ſticks as to have a pencil at the other end.

How to whet the points of the needles with the oil-ſtone. If you would whet them round, the points muſt be whet ſhort upon the oil-ſtone, not as ſewing needles are, turning them round as you whet them, as turners do: If you would have them ſloping, firſt make them blunt upon the oil-ſtone, then, holding them firm and ſteady, whet them ſloping, on one ſide only, till they come to a ſhort and roundiſh oval.

The bruſh pencil is to cleanſe the work, wipe off duſt, and to ſtrike the colours even over the ground or varniſh, when laid upon the plate.

The burniſher is a well hardened piece of ſteel, ſomewhat roundiſh at the end: Its uſes have been mentioned before.

The ſcraper is one of the inſtruments fitted for clearing the plate of all deep ſcratches or ſtrokes, which the burniſher will not take away; they are firſt to be ſcraped out with the ſcraper, carrying an even hand, that you may not make more work; and afterwards what has been ſcraped is to be burniſhed.

The compaſſes are chiefly uſed in meaſuring diſtances, or ſtriking circles, or ſome part or portion of them, where you would have your work to be exact.

The ruler is uſed chiefly in drawing all the ſtraight hatches or lines of the deſign upon the plate, or to mark out diſtances upon ſtraight lines.

The ſtift is uſed for drawing through all the outmoſt lines or circumferences

circumferences of the print, pattern, or drawing which is etched after.

To make the frame. The frame is an intire board, about the top and ſides of which is faſtened a ledge, about two inches broad, to keep the aqua-fortis from running off from the ſides, when it is poured on; the lower end of this board is to be placed in the trough, leaning ſloping againſt a wall or ſome other thing, in which are to be placed ſix ſeveral pegs of wood to reſt the plate upon.

The trough is made of a fine firm piece of elm or oak, ſet upon four legs, the hollow of which is in width four inches, and of ſuch length as may be fit for uſe.

The hollow muſt be ſomething deeper in the middle, that the water, running thither, may fall through a hole, made there for that purpoſe, into an earthen pan well leaded.

The inſide of this board and trough muſt be covered with a thick oil-colour, to hinder the aqua-fortis from eating or rotting the board.

The poliſhing of the plate. Beſides what has been ſaid of poliſhing the copper-plate for engraving (ſee ENGRAVING) take the directions following.

1. The plate being well planiſhed or forged, chuſe the ſmoothest ſide for poliſhing; then fix it upon a board a little declining, and rub it firmly and evenly all over with a piece of grindſtone, often throwing water upon it, ſo long till there remain no dints or flaws or marks of the hammer.

2. Waſh it clean, and, with a piece of good pumice-ſtone, rub it croſs-ways to the former, till the marks of the grindſtone are rubbed out.

3. Then waſh it clean again, and rub it with a fine hone and water, croſs-ways to the former, till the marks of the pumice-ſtone are rubbed out.

4. Waſh it again, and, with a piece of charcoal without knots, being heated red-hot, and quenched in urine, the outſide having been pared off, rub the plate with water, till all the ſmall ſtrokes of the hone diſappear.

5. If there ſhall yet remain any ſmall ſtrokes or ſcratches, rub them out with the end of the burniſhing iron; but, if they happen to be pretty deep, then you muſt make uſe of your ſcraper to ſcrape them out, and afterwards burniſh them, and laſtly charcoal them, as before directed, till the plate is glazed; and then it is finiſhed.

To make the hard varniſh for ETCHING. Take Burgundy or Greek pitch ten ounces, of colophony or roſin the ſame quantity, of nut oil eight ounces; melt the pitch or roſin in an earthen pot over a gentle fire; then put in the oil, and let them boil

for the ſpace of half an hour; then ſet it on a more ſlow fire, and let it cool a little, till it appear like a glewy ſyrup; then cool it a little more, and ſtrain it, and, when it is almoſt cold, put it into a glazed pot for uſe: This will keep good for ſeven years and more.

To make the ſoft varniſh for ETCHING. Take of virgin-wax ſix ounces, maſtic in drops four ounces, aſphaltum two ounces; grind the maſtic and aſphaltum ſeparately very fine, and ſift them through a fine hair ſieve; then melt the wax in an earthen pot, and ſtrew in the maſtic and aſphaltum, keeping ſtirring upon the fire, till they be well diſſolved and mixed, which will be in about half an hour; then let it cool a little; and pour it into a baſon of water, but do not let the dregs go in; and, having wetted your hands, take it out of the water, and make it up into rolls before it is cold.

Or thus: Take of virgin-wax eight ounces, aſphaltum four ounces, amber and maſtic of each two ounces; reduce the three laſt into a fine powder; mix them over a gentle fire, ſo that it may not be burnt; then take it off the fire, pour it into a veſſel of fair water, and make it up into rolls or balls, and keep it from the duſt; when you have occaſion to uſe it, take a quantity of it, and tie it up in a piece of taffety or ſilk, and uſe it according as you will be directed hereafter.

Or thus: If it be for a red ground, take red lead, grind it very well, and temper it with varniſh.

Or thus: For another red ground, take red lead or vermilion, and, having ground it very well, grind it again with linſeed oil, and lay it on very thin.

Or thus: Take virgin-wax two ounces, aſphaltum, amber, and maſtic, of each one ounce, but, if the weather be cold, but half an ounce of maſtic; roſin and ſhoemakers pitch of each half an ounce, common varniſh a quarter of an ounce; melt the wax in an earthen veſſel; then put in the other ingredients by degrees; mix them well, and make it up into rolls or balls, and keep it from duſt for uſe.

Or thus: For a white ground, take roſin four ounces, wax two ounces; melt them together, adding Venetian ceruſs, finely ground, four drachms.

Or thus: For a black ground, take aſphaltum two ounces, bees-wax one ounce; melt them together, and, while they are warm, lay it thinly on with a lawn rag.

To make the prepared oil. Heat oil olive in an earthen veſſel, and put into it a ſufficient quantity of ſheeps ſuet tried, ſo much that, it being dropped upon a cold thing, the matter will be a little hardened and firm; let them boil together for the ſpace of an hour,

hour, till they become of a reddiſh colour, leſt they ſhould ſeparate, when they come to be uſed.

This mixture is to render the fat more liquid, and prevent it from cooling too faſt; for the fat alone would be no ſooner on the pencil, but it would grow cold. You muſt likewiſe remember not to fail in putting more oil in winter than in ſummer.

To make aqua-fortis. Take of diſtilled white-wine vinegar one quart, ſal armoniac and bay ſalt of each four ounces, of verdigreaſe almoſt three ounces; put all theſe together into a pretty large earthen veſſel well glazed; cover the pot cloſe; ſet it over a quick fire, taking care that they do not boil over; give it as ſpeedily as you can two or three great waulms, and no more; when it is ready to boil, uncover the pot, and ſtir it now and then with a bit of ſtick; but take care that it does not boil over; when it has boiled, take it off, and ſet it by to cool, keeping it ſtill cloſe covered; and, when it is cold, put it into a glaſs bottle, with a glaſs ſtopple.

If it proves too ſtrong, in Etching, you may weaken it with a glaſs or two of the ſame vinegar you made it of.

The method of uſing the hard varniſh. 1. Heat the plate, being poliſhed, over a chafing-diſh of coals, and with a little ſtick take ſome of the firſt varniſh, and put a drop of it on the top of your finger, and with it touch the plate lightly, at equal diſtances, laying on the varniſh equally, and heating the plate again as it grows cold, preſerving it carefully from getting any duſt or filth; then, with the ball of your thumb, dab it upon the plate, till, wiping your hand over all, you make it more ſmooth and equal.

And, in this, great care muſt be taken that the varniſh be not too thick upon the plate, nor your hand ſweaty.

2. When you have done this, take a great lighted candle, that burns clear, with a ſhort ſnuff, placing the corner of the plate againſt a wall, and, holding the varniſhed ſide of the plate downwards over the candle, as cloſe as you can, not to touch the varniſh, guide the flame all over the plate, till it is all perfectly blacked; let it not get any duſt nor filth till it is dry.

3. Hang the varniſhed plate to dry, over a charcoal fire, with the varniſhed ſide upwards, which will ſmoak; when the ſmoak abates, take away the plate, and with a pointed ſtick ſcratch the near ſide of it; and, if the varniſh comes eaſily off, hang it over the fire again, for a little while, till the varniſh will not come off too eaſily; then take it from the fire, and ſet it by to cool.

If the varniſh ſhould be too hard, caſt cold water on the back-ſide of the plate, to cool it, that the heat may not make it too hard and brittle.

In the next place, place it on a low deſk, or ſome ſuch-like

thing, and cover that part which you do not work on with a ſheet of fine white paper, and a ſheet of brown paper over that, on which you may reſt your hand, to keep it from the varniſh.

If you make uſe of a ruler, lay ſome part of it upon the paper, that it may not rub off the varniſh; and take an eſpecial care, that no duſt or filth get in between the paper and the varniſh, for that will hurt it.

The method of ETCHING. 1. In making lines or hatches, ſome bigger and ſome leſſer, ſtraight or crooked, you muſt uſe ſeveral ſorts of needles, bigger or leſſer, as the work requires.

2. The large lines are made by leaning hard on the needle, the point being ſhort and thick, but a round point will not cut the varniſh clear; or by making divers lines, or hatches one very cloſe to another, and then by paſſing over them again with a thicker needle; or by making them with an indifferent large needle, and letting the aqua-fortis lie the longer thereon.

The beſt needles for this work are thoſe that are whetted ſloping with an oval, becauſe their ſides will cut that which the round ones will not.

3. If your lines or hatches ought to be of an equal thickneſs from end to end, lean on the needle with an equal force; leaning lightly where you would have the lines or ſtrokes fine or ſmall, and heavier where you would have the lines appear deep or large, whereby the needle may have ſome impreſſion on the copper.

4. If the lines or hatches are too ſmall, paſs over them again with a ſhort round point, of ſuch a bigneſs as you would have the line of, leaning ſtrongly where you would have the line deep.

5. The manner of holding the needle with oval points, which are moſt proper to make large and deep ſtrokes, much reſembles that of a pen, only the flat ſide whetted is uſually held towards the thumb; but they may be uſed with the face of the oval turned towards the ſide of the little finger.

6. If you would end with a fine ſtroke, you ought to do that with a very fine needle.

7. In uſing the oval points hold them as upright and ſtraight in your hand as you can, ſtriking your ſtrokes firmly and freely, for that will add much to their beauty and clearneſs.

8. In landſcapes in places fartheſt off from the ſight, as alſo neareſt the light, uſe a very ſlender point, leaning ſo lightly with your hand, as to make a ſmall faint ſtroke.

9. Be careful while you are working to bruſh off all the duſt, which you work off with the needles.

10. But this you muſt take notice of, that you ought to be able to copy any drawing or print exactly, and to draw after good

good heads of plaiſter or figures, according to your own fancy, and ſkilful in ſhadowing every thing exactly according to art; And therefore, when you imitate plaiſter, be ſure to take the true outlines or circumferences, and taking notice how the ſhadow falls, to do it very faint and ſoft as the deſign requires.

11. Therefore it is convenient that you be able to hatch with the pen exactly after good prints or copies, and, when you can perfectly do that, and draw after plaiſter, then to imitate the life; but, before you draw after the life, you muſt be very exact and true in your outlines or circumferences.

12. Now, to take the outmoſt lines in any drawing or print upon the ground of the plate, you muſt ſcrape a little white lead upon the backſide; then take a feather, and rub it over everywhere alike, and ſhake off that which remains looſe.

Having done this, lay the print on the plate, on that ſide the lead is, and faſten the four corners of it to the plate with a little ſoft wax; then take the ſtift, and draw upon the print all the outmoſt lines or circumferences exactly; when you have done this, take off the print from the plate, and all the ſame outlines and circumferences, which you drew upon the print with the ſtift, will be exactly found upon the ground.

13. Then you muſt obſerve very exactly, how your original or pattern is ſhadowed, and how cloſe the hatches are joined; how they are laid, and which way the light falls or comes in; and be ſure that you make the light fall one way; if the light falls ſideways in the print, you muſt hatch the other ſide darkeſt, which is fartheſt from the light, and ſo place the lights altogether on one ſide, and not confuſedly, part on one ſide, and part on another.

14. Take notice how cloſe all the hatches join, how they incline, and which way they twiſt and wind, which follow as exactly as you poſſibly can; but, before you begin to hatch or ſhadow, you muſt not fail to draw all the outlines with a needle upon the ground as artificially as you can, which ſhadow with your needles, of ſeveral ſorts, according to the original.

15. When you are to make a broad ſtroke, then break off the point of your needle, and whet it upon the oil-ſtone four ſquare, till it come to a point; if fine ſtrokes are to be hatched, then fine-pointed needles muſt be uſed; if middle-ſized ſtrokes, then you muſt break off the point of a middle-ſized needle, and whet it as directed before, and the ſame is to be done in all the ſizes; but ſome artiſts, in making a bold or broad ſtroke, firſt of all hatch it fine, and afterwards make it broader by degrees.

The method of ETCHING *landſcapes.* 1. Hatch that which is neareſt to the eye darkeſt, and make it loſe or decline its ſhadows by degrees, making that fainteſt which is fartheſt off.

2. The ſame method is to be obſerved in Etching a ſky, for that which is neareſt to the eye muſt be ſhadowed darkeſt; but in general as faint and ſoft as may be, loſing itſelf gradually, as before directed; and, by how much the nearer the ſky comes to the ground, by ſo much more looſe and faint muſt it be; and, when they both meet as it were together, the ſky muſt be quite loſt.

3. When the work has been hatched as exactly as you poſſibly can with the needles in imitation of the drawing or print, compare them well together, and, if you find any thing omitted, ſupply it; if amiſs, amend it.

4. In Etching a piece of perſpective, after either a drawing or a print, be ſure you ſhadow that which is neareſt to the eye the perfecteſt and ſtrongeſt; and that which is farther from it muſt decline in length, breadth, and height, according to art and proportion, letting the ſhadows loſe and grow fainter and fainter gradually, till they are in a manner loſt.

Of ETCHING *or engraving letters.* 1. Screw the copper-plate, after it has been made fit for Etching, to a hand vice, which hold over a charcoal fire till it be warm; then rub a piece of virgin-wax all over the plate, covering it all over very evenly.

2. Then with a ſtiff duck's wing feather, not ruffled, ſtorke it over the wax, laying it even and ſmooth in all parts alike, and let it cool.

3. Then, the letters or writing being written on paper with ungummed ink made with vermilion, lay the written ſide downwards upon the waxed plate, and faſten the four corners with a little ſoft wax, placing the writing ſo exactly, that the lines may run ſtraight.

4. Then rub the backſide of the paper all over with a dog's tooth, taking care not to miſs any part; then pull the paper off the plate, and you will find all the letters written on the paper left exactly upon the wax.

5. Then draw all the letters through the wax on the plate with a ſtift, and afterwards cleanſe the work from the looſe wax, that you have raiſed by ſo drawing it with a linen rag or pencil bruſh, and thus will all the letters be drawn on the copper-plate.

6. Then pour upon the plate good aqua-fortis, and it will be etched; but, if you take off all the wax and engrave it, the letters will be much more exact and fine, eſpecially if your gravers be well ground and ſharp towards the points, and then whetted ſmooth upon a good oil-ſtone, and the graving be well performed; for Etching will not perform writing ſo neatly as engraving.

The method of uſing aqua-fortis. 1. If there are any ſtrokes into which you would have the aqua-fortis to eat, or any places where the varniſh has been rubbed off, melt a little of the prepar-

ed

ed oil, before mentioned, and cover thoſe places pretty thick with a pencil.

2. Then dip a bruſh pencil or rag into the prepared oil, and rub the backſide of the plate all over, that the aqua-fortis may not hurt it, if any ſhould happen to fall on it.

3. Warm the plate gently, or dry it by a fire, to dry up all the humidity, which it may poſſibly have contracted by reaſon of the air, before you put your aqua-fortis upon it; and to prevent the varniſh from breaking up upon the firſt pouring on the aqua-fortis.

4. Place the plate in the trough, as before directed, and, having the aqua-fortis in a pot, pour it upon the plate, beginning at the top, ſo moving your hand that it may run all over the plate; do this eight or ten times; then turn the plate corner-wiſe, and pour the aqua-fortis on it that way ten or twelve times; after this, turn it again corner-wiſe the other way, pouring on the aqua-fortis eight or ten times, as before, doing thus ſeveral times for the ſpace of eight or ten minutes or more, according as the aqua-fortis is in ſtrength.

For there muſt be leſs time allowed to hard and brittle copper, for pouring on the aqua-fortis; but more to the ſoft.

5. Great nicety and care muſt be uſed in pouring on the aqua-fortis as occaſion ſhall require, and as the work ſhall be, caſting it on at ſeveral times and on ſeveral places; often where you would have it very deep, and fewer where leſs deep; and leſs yet where light, and leſſer yet where lighter; and thoſe places that are ſo light as it can ſcarcely be ſeen once or twice. Waſh it with water, and cover it where you would have it lighter.

6. Having thus covered the plates as occaſion requires for the ſecond time, place the plate on the frame as aforeſaid, and pour your aqua-fortis on it for full half an hour.

7. Then waſh it with water, and dry it, covering the places which require lightneſs, or faintneſs, that they may be proportionable to the deſign; then pour on the aqua-fortis for the laſt time, more or leſs, according to the nature of your work, and the deepneſs that it requires.

8. You may rub off the varniſh or ground, as occaſion in your work requires, with a charcoal, to ſee whether the aqua-fortis has eaten deep enough, by which you may judge of the ſpace of time that you are afterwards to employ in pouring on the aqua-fortis, in the works you will have to do; which, if the ſhadows require much depth, or ought to be very black, the aqua-fortis ought to be poured on, at the leaſt time, for an hour or better; yet you muſt remember, that no certain ſpace of time can be fixed, or limited for this.

The method of finiſhing the work. 1. All the former operations

being performed, waſh the plate with fair water, and ſet it wet upon the fire, till the mixture be well melted; and then wipe it very clean on both ſides with a linen cloth, till it is thoroughly cleanſed of all the mixture.

2. Take charcoal of willow, take off the rind, put fair water on the plate, and rub it with the charcoal, as if you were to poliſh it, and it will take off the varniſh.

But you muſt take care that the coal be free from all knots and roughneſs, and that no ſand or filth fall upon the plate.

3. Add two third parts of fair water to one third part of common aqua-fortis, and, dipping ſome linen rag in it, rub the plate all over, and this will take away the diſcoloration of it, and recover its former beauty.

4. Then wipe the plate with dry linen rags, ſo as to take off the aforeſaid water, and, holding it a little before the fire, put on a little olive oil, and with the furr of an old beaver rolled up rub the plate all over, and then, in the laſt place, wipe the plate well with a dry cloth.

5. Then if any places need touching with the graver, as it frequently happens, eſpecially where it is to be very deep or black, carefully perfect them; and then the plate is fit to be carried to the rolling preſs.

The manner of uſing the ſoft varniſh. 1. Having made the plate ready, by clearing it with charcoal and fair water, waſh it well and dry it, and then rub it well over with a fine white chalk ſcraped, and a fine rag, not touching it with your fingers.

2. Lay the plate over a chafing-diſh of ſmall-coal, yet ſo that the fire may have air; then, having tied up ſome of the ſoft varniſh in a fine rag, rub it up and down the copper-plate, ſo that it melt in a ſmear or cover, neither too thin nor too thick; then make it as ſmooth as poſſibly you can all one way, with a ſtiff duck's feather, and then croſſwiſe, till it lies ſmooth and even.

But care muſt be taken that the plate be not too hot, for, if it lies till the ground ſmoaks, the moiſture will be dried up, and that will cauſe the ground to break or fly up and ſpoil the work.

3. Then having ready ſome ceruſs or white lead ground with gum water, ſo that it is of a convenient thickneſs for ſpreading on the copper; ſtrike the plate with it, croſs over twice or thrice till it is ſmooth, with a large pencil or ſmall bruſh, and then gently ſmooth the white with a large bruſh, made of ſquirrels tails, and afterwards ſet it by till it is dry.

4. Or, if you pleaſe, you may black the varniſh with a candle, as before directed, and then, if it be cold, warm it over the fire, till the varniſh begins to melt, that the ſmoke may melt into the ground, ſo that it will not rub off with your hand.

The

The method of ETCHING *upon ſoft varniſh.* 1. This way of Etching is the ſame as that of the hard varniſh, but you muſt take great care not to hurt the varniſh. This may be done by placing two little boards on the ſides of the plate, and laying another thin one croſs over them, but ſo as not to touch the plate. This will ſerve to reſt your hand while you are working.

2. Then lay the plate on a deſk, if you pleaſe, for by that means the ſuperfluous matter may fall away of itſelf.

3. But, if the deſign you have to transfer on the plate is any copy or print, ſcrape ſome red chalk all over the backſide of it, and upon that ſcrape ſome ſoft charcoal, till it mingle with the chalk, and rub it all over till it be fine, and even with a large ſtiff pencil; and then lay it upon the plate, and draw over the outſtrokes with a blunt needle.

And, as you work, you need not ſcratch hard into the copper; but only ſo that you may ſee the needle go through the varniſh to the copper.

4. Be ſure, whenever you leave your work, to take care to wrap the plate up in a paper, to keep it from hurt, and from being injured by the air, which will dry the varniſh; and in winter time wrap it up in a piece of woollen, as well as paper; for, if the froſt get to it, it will cauſe the varniſh to riſe from the copper in the eating in.

There will alſo one inconvenience attend the letting the varniſh lie too long upon the plate before the work is finiſhed; for the ſpace of three or four months will conſume the moiſture, and ſo ſpoil all.

5. It will be beſt to mark the deſign upon ſoft varniſh, with black lead or chalk, if the ground is white; but with red chalk, if the ground be black.

6. The deſign being traced on the varniſh, caſt a little fair warm water upon the varniſhed plate, and then rub upon the white lead, to moiſten it all over with a ſoft clean ſpunge; and, afterwards waſh the plate to take away the whiting, and dry it.

7. In the laſt place, waſh it all over with aqua-fortis mixed with fair water, and this will take away the whiting, which then waſh with common water and dry it; and thus will the plate be prepared for aqua-fortis.

The manner of uſing the aqua-fortis and finiſhing the work.

1. Put ſoft wax, red or green, round the brims of the plate, being firſt drawn into a long roll or ſtring, and raiſe it above the varniſh the length of half a barley-corn's length; ſo that, placing the plate level, the water, being poured upon the plate, may be retained.

But, that you may be ſure that the aqua-fortis ſhall not run out, heat a knife in the fire, and ſear the wax round about un-

der the plate very close; and be sure you fasten the wax as near to the edges of the plate as you can conveniently.

2. Mix six ounces of single or common varnish with two ounces of common water, and pour it gently upon the plate, so so that it may cover it fully, and all over; and so will the fuller hatchings be all of bubbles, while the fainter will appear white, not making any sudden operations to the view.

You must take notice of this, that, in order to weaken the aqua-fortis, you may mix it with vinegar, or a little of that aqua-fortis, which has been used before; or, if the liquor be too strong, it will make the work very hard, and sometimes make the ground to break up; the deeper the aqua-fortis lies, the harder it will eat.

3. When you have perceived the water has operated a little while, pour it off into a glazed earthen vessel, to be kept to be used with some other, and throw fair water on the plate, to wash away the aqua-fortis, and afterwards dry the plate.

4. Where you would have the cut to be faint, tender, or sweet, cover those places with prepared oil, and then cover the plate again with aqua-fortis as before, leaving it on for eight or ten minutes, or longer; then pour off the aqua-fortis as before, and wash and dry the plate, covering with the prepared oil such other places, which you would not have so deep as the rest.

5. In the last place, put on the aqua-fortis again, and let it lie on for the space of half an hour, more or less; and then pour it off, and wash the plate with fair water as before.

6. As you would have your lines or strokes to be deeper and deeper, so cover the sweeter or fainter parts by degrees with the prepared oil, that the aqua-fortis may lie the longer on the deepest strokes.

7. Then take off the border of wax, and heat the plate so that the oil and varnish may be thoroughly melted; then wipe them clean off with a linen cloth, and afterwards rub the plate over with oil of olives, and a roller made up of a piece of old beaver hat; and, if there be need, touch it up with the graver.

8. But if, at last, you shall have forgotten any thing, then rub the plate well with crumbs of bread, that no filth or oil may remain upon it.

9. Then heat the plate over a charcoal fire, and spread the soft varnish upon it with a feather, as before, so that the hatchings may be filled with varnish; black it, and then touch it over again, or add what you intend.

10. Make your hatchings with such needles as the work requires, taking care to cover the first graving on the plate with prepared oil, before you lay on the aqua-fortis, lest the varnish should not have covered all over; then let the aqua-fortis eat

into the work, and, when it has ſo done, cleanſe the plate as before.

11. When you have cleanſed the plate, if you perceive that the aqua-fortis has not eaten deep enough in ſome places, you muſt mend thoſe effects with the graver.

12. That you may know whether the aqua-fortis has eaten deep enough, after it has lain a quarter of an hour, pour it off from the plate into a glaſs, and waſh it with a little fair water, and ſcrape off a little bit of the ground with a knife, where it is hatched, and may be leaſt prejudicial to the work; and, if you find it has not eaten deep enough, cover the bare place of the plate with prepared oil, and put on aqua-fortis again, letting it lie till you think it deep enough.

13. Or you may mix it with ſome new aqua-fortis, if you think what you have already uſed be too weak; and you will at length arrive at a certainty by many trials and practice.

14. Or you may make a trial upon a waſte piece of copper, rudely hatched, pouring the aqua-fortis both upon the plate, and that at one and the ſame time; and, after a ſufficient ſeaſon, take off a little piece of the ground with a knife, from the waſte piece of copper, where it is hatched; and, if it be not deep enough, cover it again with the prepared oil, and make a new trial, and after this manner proceed till you find the aqua-fortis has eaten deep enough.

15. Waſh the plate with a little fair water before you warm it, for otherwiſe the aqua-fortis will ſtain the place.

16. If the ground has been broken up in any place, pour the aqua-fortis off the plate, waſh it with fair water, and cover it with prepared oil, and then pour on the aqua-fortis again, and it will preſerve the plate from injury.

17. That you may make the aqua-fortis work harder or ſofter, you muſt cover thoſe places of the plate which you would have to be faint, after the aqua-fortis has been once poured off the plate, with the prepared oil; which oil muſt be uſed by degrees, as you would have the work fainter.

This will be found neceſſary in Etching landſcapes, becauſe they muſt gradually loſe and ſtand at a diſtance.

ETERNITY, is repreſented, in painting, in the form of a fair lady, having three heads, ſignifying the time paſt, preſent, and to come; ſhe holds in her left hand a circle, pointing with the fore-finger of her right hand up to heaven. The circle ſhews, that Eternity has neither beginning nor end.

ETHICS, is repreſented, in painting, by a lady of a ſober, grave aſpect, holding the inſtrument archipendulum in one hand, with the other a lion bridled.—The lion demonſtrates, that moral philoſophy ſubdues and curbs the paſſions, teaches to obſerve a me-

a medium between virtue and vice; the inſtrument ſhews the juſt equilibrium, not to tranſgreſs to either of the extremes.

E. V. ſtands for Eneas Vigi of Parma, who engraved the works of Roſſi, Titian, Buonaroti, Julio Clovio, and of Baccio Bandinelli.

E. V. H. ſtands for Eſacah Van Hulſen.

EVENING, is repreſented, in painting, by a babe, winged, of a duſkiſh carnation colour, in a poſture of flying towards the weſt; a bright ſtar on his head; in his right hand an arrow; in his left a bat.—His flying ſhews it to be the Evening twilight; the ſtar is Heſperus; the arrow ſignifies the vapours attracted by the ſun, which, having nothing to ſuſtain them, fall down, and are more or leſs noxious, according to the places high or low.

EUROPE, is repreſented, in painting, by a lady in a very rich habit of ſeveral colours, ſitting between two croſs cornucopia's, the one full of all ſorts of grain, and the other of black and white grapes; holding a temple in her right hand, and with the fore-finger of the left hand points at ſcepters and crowns; a horſe amongſt trophies of arms; a book alſo with an owl on it; many muſical inſtruments by her, and a pallet for a limner with pencils. All which ſhews it to be the principal part of the world, for religion, arts, and arms.

EURUS, the Eaſt-wind, is repreſented, in painting, by a youth with puffed and blown cheeks, as all the other winds muſt be, having wings on his ſhoulders, his body like a tawny-moor; upon his head a red ſun.

EURYTHMY, in painting and ſculpture, a certain majeſty, elegance, and eaſineſs appearing in the compoſition of divers members, or parts of a body or painting, and reſulting from the fine proportions thereof.

EUTERPE, ſo called for giving delight, and is repreſented crowned with a garland of flowers, holding in each hand ſundry wind inſtruments.

EXERCISE, is repreſented, in painting, by a man in his juvenile years, cloathed in a ſhort garment of divers colours; his arms naked, a clock on his head, a golden circle in one hand, in the other a ſcroll, inſcribed encyclopædia. He has winged feet; at his right ſide are ſeveral ſorts of arms; at his left, divers inſtruments of agriculture.—His youth denotes his being able to ſuſtain the fatigues of Exerciſe; his naked arms, his being in a readineſs; encyclopædia ſignifies the circle of all ſciences, which are attained by Exerciſe, as well as ſkill in arms; the clock denotes Exerciſe by divers motions of the wheels that diſtinguiſh the time and hour.

EXPRESSION, in painting, is a term uſed to ſignify the natural

tural and lively repreſentation of the ſubject of the ſeveral objects intended to be ſhewn.

The Expreſſion conſiſts principally in repreſenting the human body, and all its parts, in the action ſuitable to it; in exhibiting in the face the ſeveral paſſions proper to the figures, and obſerving the motions they expreſs on the external parts. See ATTITUDE.

The term Expreſſion is frequently confounded with that of paſſion; but there is a difference betwixt them, which is this: Expreſſion is a general term, implying a repreſentation of an object agreeably to its nature and character, and the uſe or office it is to have in the work; and paſſion, in painting, is a motion of the body, accompanied with certain diſpoſitions or airs of the face, which mark an agitation in the ſoul; ſo that every paſſion is an Expreſſion; but every Expreſſion is not a paſſion.

Whatever the general character of the ſtory is, the picture muſt diſcover it throughout, whether it be joyous, melancholy, grave, terrible, &c. The nativity, reſurrection, and aſcenſion, ought to have the general colouring; the ornaments, back ground, and every thing in them riant and joyous; and in a crucifixion, interment, or a pietà, the Bleſſed Virgin with a dead Chriſt, the contrary.

But a diſtinction muſt be made between grave and melancholy, as in a holy family, of Raphael's deſign at leaſt, where the colouring is brown and ſolemn, but yet altogether the picture has not a diſmal air, but quite the contrary; beſides another holy family of Rubens, painted as his manner was, as if the figures were in a ſunny room; if Raphael's colouring had been the ſame with Rubens's on this occaſion, doubtleſs it would have been the worſe for it. There are certain ſentiments of awe and devotion, which ought to be raiſed by the ſight of pictures of that ſubject, which that ſolemn colouring contributes very much to.

There is a fine inſtance of a colouring, proper for melancholy ſubjects, in a pietà of Van Dyke: That alone would make one not only grave, but ſad at firſt ſight; and another inſtance of a coloured drawing of the fall of Phaeton, after Giulio Romano, which ſhews how much this contributes to the Expreſſion. It is different from all other colourings, and admirably adapted to the ſubject; there is a reddiſh purple tinct ſpread throughout, as if the world was all inveloped in ſmouldering fire.

There are certain little circumſtances that contribute to the Expreſſion. Such an effect have the burning lamps, that are in the cartoon of healing at the Beautiful gate of the temple; one ſees the place is holy, as well as magnificent.

The large fowl that are ſeen on the fore-ground in the cartoon

of the draught of fiſhes, have a good effect. There is a certain ſea wildneſs in them; and, as their food was fiſh, they contribute mightily to expreſs the affair in hand, which was fiſhing. They are a fine part of the ſcene.

The robes, and other habits of the figures; their attendants, and enſigns of authority, or dignity, as crowns, maces, &c. help to expreſs their diſtinct characters; and commonly even their place in the compoſition. The principal perſons and actors muſt not be put in a corner, or towards the extremities of the picture, unleſs the neceſſity of the ſubject requires it. A Chriſt, or an apoſtle, muſt not be dreſſed like an artificer, or a fiſherman; a man of quality muſt be diſtinguiſhed from one of the lower orders of men, as a well-bred man always is in life from a peaſant. And ſo of the reſt.

Every body knows the common or ordinary diſtinctions by dreſs; but there is one inſtance of a particular kind, which I will mention, as being likely to give uſeful hints to this purpoſe, and moreover very curious. In the cartoon of giving the keys to St. Peter, our Saviour is wrapped only in one large piece of white drapery, his left arm, and breaſt, and part of his legs naked; which undoubtedly was done to denote him now to appear in his reſurrection body, and not as before his crucifixion, when this dreſs would have been altogether improper. And this is the more remarkable, as having been done upon ſecond thoughts, and after the picture was perhaps finiſhed, which may be proved by a drawing of this cartoon, very old, and probably made in Raphael's time, though not of his hand, where the Chriſt is fully clad; he has the very ſame large drapery, but one under it that covers his breaſt, arm, and legs, down to the feet. Every thing elſe is pretty nea rthe ſame with the cartoon.

That the face and air, as well as our actions, indicate the mind, is indiſputable. It is ſeen by every body in the extremes on both ſides. For example, let two men, the one a wiſe man, and the other a fool, be ſeen together dreſſed, or diſguiſed as you pleaſe, one will not be miſtaken for the other, but diſtinguiſhed with the firſt glance of the eye; and theſe characters are ſtamped upon the face, ſo as to be read by every one, when in the utmoſt extremes; they are ſo proportionably, when more or leſs removed from them; and legible accordingly, and in proportion to the ſkill of the reader.

The like may be obſerved by good and ill nature, gentleneſs, ruſticity, &c.

Every figure and animal muſt be affected in the picture as one ſhould ſuppoſe they would, or ought to be. And all the Expreſſions of the ſeveral paſſions and ſentiments muſt be made with regard to the characters of the perſons moved by them. At

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the raiſing of Lazarus, ſome may be allowed to be made to hold ſomething before their noſes, and this would be very juſt, to denote that circumſtance in the ſtory, the time he had been dead; but this is exceedingly improper in the laying our Lord in the ſepulchre, although he had been dead much longer than he was; however, Pardenone has done it.

When Apollo fleas Marſyas, he may expreſs all the anguiſh and impatience the painter can give him, but not ſo in the caſe of St. Bartholomew.

That the Bleſſed Mary ſhould ſwoon away through the exceſs of her grief, is very proper to ſuppoſe; but to throw her in ſuch a poſture, as Daniel da Volterra has done, in that famous picture of the deſcent from the croſs, is by no means juſtifiable.

Polydore, in a drawing of the ſame ſubject, has finely expreſſed the exceſſive grief of the Virgin, by intimating it was otherwiſe inexpreſſible: Her attendants diſcover abundance of paſſion and ſorrow in their faces; but her's is hid by drapery held up by both her hands: The whole figure is very compoſed and quiet; no noiſe, no outrage, but great dignity appears in her, ſuitable to her character.

In that admirable cartoon of St. Paul preaching, the Expreſſions are very juſt and delicate throughout; even the back ground is not without its meaning; it is expreſſive of the ſuperſtition St. Paul was preaching againſt. But no hiſtorian, or orator, can poſſibly give ſo great an idea of that eloquent and zealous apoſtle, as that figure of his does; all the fine things related as ſaid or wrote by him cannot; for there I ſee a perſon, face, air, and action, which no words can ſufficiently deſcribe, but which aſſure me as much as thoſe can, that that man muſt ſpeak good ſenſe, and to the purpoſe. And the different ſentiments of his auditors are as finely expreſſed; ſome appear to be angry and malicious, others to be attentive, and reaſoning upon the matter within themſelves, or with one another; and one eſpecially is apparently convinced. Some before the apoſtle; the others are behind him, not only as caring leſs for the preacher, or the doctrine, but to raiſe the apoſtolic character, which would loſe ſomething of its dignity, if his maligners were ſuppoſed to be able to look him in the face.

Elymas the ſorcerer is blind from head to foot; but how admirably is terror and aſtoniſhment expreſſed in the people preſent, and how variouſly, according to the ſeveral characters! The proconſul has theſe ſentiments, but as a Roman and a gentleman; the reſt in ſeveral degrees and manners.

The ſame ſentiments appear alſo in the cartoon of the death of Ananias, together with thoſe of joy and triumph, which naturally

turally ariſe in good minds, upon the ſight of the effects of divine juſtice, and the victory of truth.

Nor is the Expreſſion in another drawing of the deſcent of the Holy Ghoſt leſs excellent than the other parts of it. The Bleſſed Virgin is ſeated in the principal part of the picture, and ſo diſtinguiſhed, as that none of the company ſeems to pretend to be in competition with her; and the devotion and modeſty with which ſhe receives the ineffable gift, is worthy of her character. St. Peter is on her right hand, and St. John on her left; the former has his arms croſſed on his breaſt, his head reclined, as if aſhamed of having denied ſuch a maſter, and receives the inſpiration with great compoſure; but St. John with a holy boldneſs raiſes his head and hands, and is in a moſt becoming attitude; the women behind St. Mary are plainly of an inferior character. Throughout there is great variety of Expreſſions of joy and devotion, extremely well adapted to the occaſion.

I will add one example more of a fine Expreſſion; becauſe, though it is very juſt and natural, it has been done by Tintoret, in a drawing of his. The ſtory is, our Saviour's declaration to the apoſtles at ſupper with him, that one of them ſhould betray him: Some are moved one way, and ſome another, as is uſual; but one of them hides his face, dropped down betwixt both his hands, as burſt into tears from an exceſs of ſorrow, that his Lord ſhould be betrayed, and by one of them.

In portraits it muſt be ſeen whether the perſon is grave, gay, a man of buſineſs, or wit, plain, genteel, &c. each character muſt have an attitude and dreſs; the ornaments and back ground proper to it; every part of the portrait, and all about it, muſt be expreſſive of the man, and have a reſemblance as well as the features of the face.

If the perſon has any particularities, as to the ſet or motion of the head, eyes, or mouth, ſuppoſing it be not unbecoming, theſe muſt be taken notice of, and ſtrongly expreſſed. They are a ſort of moving features, and are as much a part of the man as the fixed ones; ſome raiſe a low ſubject, and contribute more to a ſurpriſing likeneſs than any thing elſe. Van Dyke, in a picture, has given a briſk touch upon the under lip, which makes the form and ſet of the mouth very particular; and doubtleſs was an air which Don Diego de Guſman, whoſe portrait it is, was accuſtomed to give himſelf, which an inferior painter would not have obſerved, or not have dared to have pronounced, at leaſt ſo ſtrongly; but this, as it gives a marvellous ſpirit and ſmartneſs, undoubtedly gave a proportionable reſemblance.

If there be any thing particular in the hiſtory of the perſon, which is proper to be expreſſed, as it is ſtill a farther deſcription of him, it is a great improvement to the portrait, to them that know

know that circumſtance. There is one inſtance of this in a picture of Van Dyke, made of John Lyvens, who is drawn as if he was liſtening at ſomething; which refers to a remarkable ſtory in that man's life. The print is in the book of Van Dyke's heads: Which book, and the heads of the artiſts, in the lives of Giorgio Vaſari, are worth conſidering, with regard to the variety of attitudes ſuited to the ſeveral characters, as well as upon other accounts.

Robes, or other marks of dignity, or of a profeſſion, employment, or amuſement, a book, a ſhip, a favourite dog, or the like, are hiſtorical Expreſſions common in portraits, which muſt be mentioned on this occaſion; and to ſay more of them is not neceſſary.

There are ſeveral kinds of artificial Expreſſions indulged to painters, and practiſed by them, becauſe of the diſadvantage of their art in that particular, in compariſon of words.

To expreſs the ſenſe of the wrath of God, with which our Bleſſed Lord's mind was filled, when in his agony, and the apprehenſion he was then in of his own approaching crucifixion, Frederico Barocci has drawn him in a proper attitude; and not only with the angel holding the cup to him, that is common; but in the back ground you ſee the croſs and flames of fire. This is very particular and curious.

In the cartoon where the people of Lycaonia are going to ſacrifice to St. Paul and Barnabas, the occaſion of all that is finely told.

The man who was healed of his lameneſs, is one of the forwardeſt to expreſs his ſenſe of the divine power, which appeared in thoſe apoſtles; and, to ſhew it to be him, not only a crutch is under his feet on the ground, but an old man takes up the lappet of his garment, and looks upon the limb, which he remembered to have been crippled, and expreſſes great devotion and admiration; which ſentiments are alſo ſeen in the other with a mixture of joy.

When our Saviour committed the care of his church to St. Peter, the words he uſed on that occaſion are related by Raphael, who has made him pointing to a flock of ſheep; and St. Peter, to have juſt received two keys. When the ſtory of Joſeph's interpretation of Pharaoh's dream was to be related, Raphael has painted thoſe dreams in two circles over the figures; which he has alſo done when Joſeph relates his own to his brethren. His manner of expreſſing God's dividing the light from darkneſs, and the creation of the ſun and moon, is altogether ſublime. The prints of thoſe laſt mentioned pictures are not hard to be found; they are in what they call Raphael's bible, but the paintings

ings are in the Vatican; the beſt treaſury of the works of that divine painter, except Hampton-court.

The hyperbolical artifice of Timanthes, to expreſs the vaſtneſs of the Cyclops, is well known, and was mightily admired by the ancients; he made ſeveral ſatyrs about him, as he was aſleep; ſome were running away as frightened; others gazing at a diſtance, and one was meaſuring his thumb with his thyrſus; but ſeeming to do it with great caution, leſt he ſhould awake.

This Expreſſion was copied by Giulio Romano, with a very little variation. Correggio, in his picture of Danaë, has finely expreſſed the ſenſe of that ſtory; for, upon falling of the golden ſhower, Cupid draws off her linen covering, and two loves are trying upon a touch-ſtone a dart tipped with gold.

I will add but one example more of this kind, and that is of Nicholas Pouſſin, to expreſs a voice, which he has done in the baptiſm of our Saviour, by making the people look up and about; as it is natural for men to do, when they hear any ſuch, and know not whence it comes, eſpecially if it be otherwiſe extraordinary, as the caſe was in this hiſtory.

Another way practiſed by painters to expreſs their ſenſe, which could not otherwiſe be done in painting, is by figures repreſentative of certain things. This they learned from the ancients, of which there are abundance of examples, as in the Antonine pillar, where to expreſs the rain that fell, when the Roman army was preſerved by the prayers of the Theban legion, the figure of Jupiter Pluvius is introduced. Raphael, in the paſſage of Jordan, has repreſented that river by an old man dividing the waters, which are rolled and tumbled very notably.

I will add but one way of Expreſſion more, and that is plain writing.

Polygnotus, in the paintings made by him in the temple of Delphos, wrote the names of thoſe whom he repreſented.

The old Italian and German maſters improved upon this; the figures they made were ſpeaking figures; they had labels coming out of their mouths, with that written in them which they were intended to be made to ſay; but even Raphael and Annibal Carracci have condeſcended rather to write than to leave any ambiguity or obſcurity in their work.

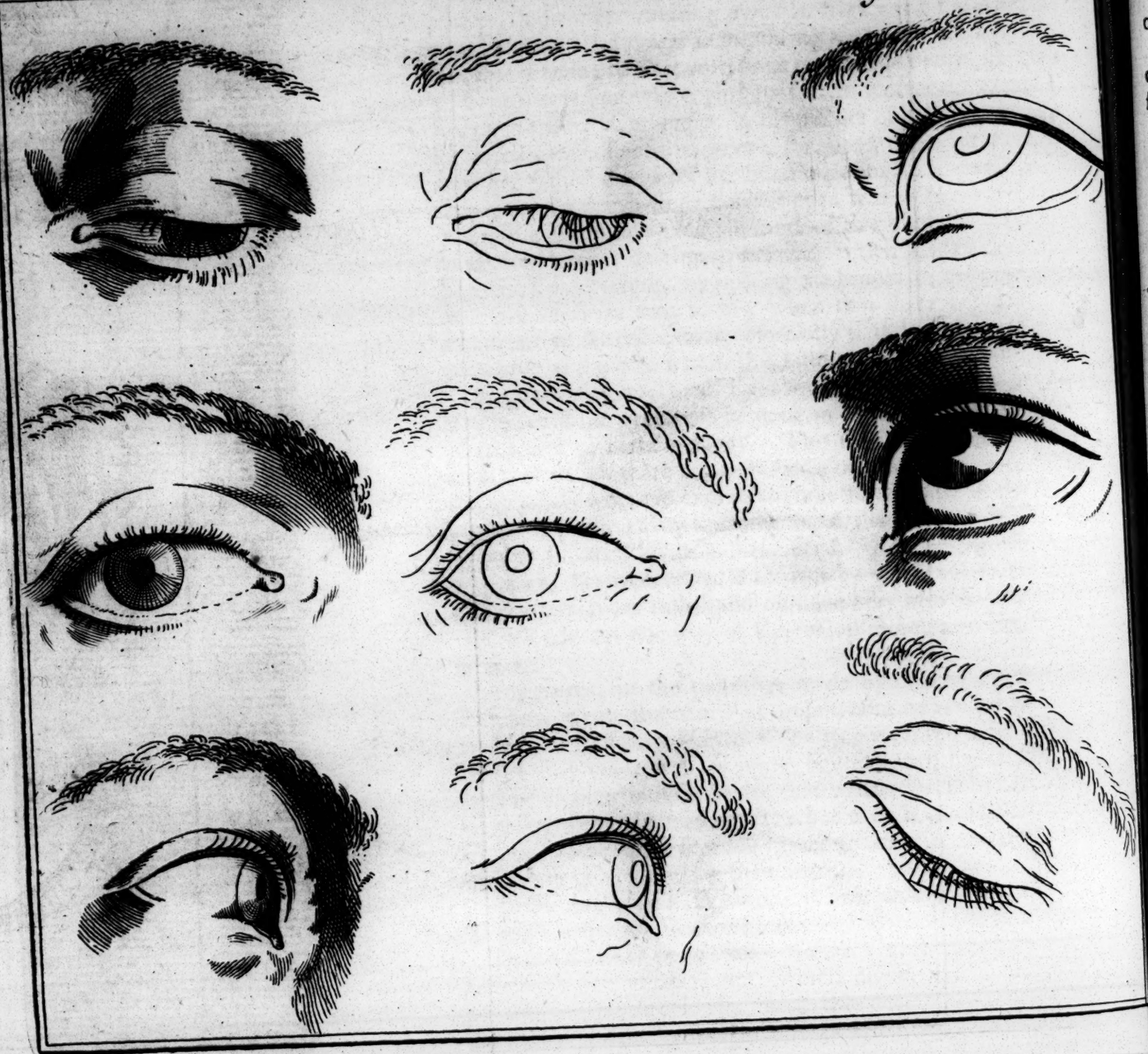
For the method of EXPRESSING *the paſſions in the countenance*, ſee each under its proper article.

To EXTEND *or contract a picture.* 1. Encompaſs the picture with one great ſquare, which divide into as many little ones as you pleaſe; having done this according as you would have your picture either greater or leſs, make another ſquare greater or leſs, which divide into the ſame number of equal ſquares, which let be drawn with a black lead plummet.

2. Take

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2. Take your black lead pen, and draw the picture by little and little, paſſing from ſquare to ſquare, by the example of the pattern, until you have gone all over with it; obſerving that, in what part of the ſquare the picture lies, you draw the like part in the ſquare anſwerable thereto, till you have finiſhed the whole.

3. Then draw it over with a pen, in which ſecond drawing of it, you may eaſily mend any fault, and ſhadow it at pleaſure.

4. Laſtly, when it is thoroughly dry, rub it over with the crumb of white bread, and it will take off all the black lead ſtrokes; ſo will the draught remain fair upon the paper.

EYES. For the drawing of Eyes. See plate XV.

EYES, to paint in miniature, ſhade the white of the Eyes, with a faint blue and light fleſh colour, and do the corners on the ſides of the noſe with vermilion and white, with a ſmall ſtroke of carmine. All this is ſoftened with a mixture of vermilion, carmine, and white, and a very little oker.

The iris of the Eye muſt be a mixture of ultramarine and white; this little more in quantity than the other, adding thereto a little briſtle, if it be of a kind of a light haſel, or a little black, if it is too grey.

The pupil, or ſight of the Eye, muſt be done with black, and the iris ſhaded with indigo, biſtre, or black, according to the colour it is of; but, of what colour ſoever it is, it will be proper to draw a fine circle of vermilion round the ſight, which blended with the reſt in finiſhing gives life to the Eye.

The circumference of the Eyes, that is, the ſight and laſhes, are to be done with biſtre and carmine, when they are ſtrong; particularly the upper part, which muſt be afterwards ſoftened with red or blue mixtures, mentioned at the latter end of the article of CARNATION, that the whole may appear of a piece and continued.

Having done this, give a ſmall touch of pure white, upon the ſight of the Eye, next to the light, which makes it ſhine and alive. You may alſo heighten the white of the Eye next the light.

The Eye-brows and the beard are coloured like the ſhades of the fleſh, (ſee CARNATION) and are finiſhed with biſtre, oker, or black, according to the colour they are of, drawing them with fine ſtrokes as they ought to lie, in exact imitation of nature; and heighten the lights with oker, biſtre, a little vermilion, and a good deal of white.

Johannes ab EYK, commonly called *John of Bruges*, born at Maſſeyk on the river Maez, in the Low Countries, anno 1370; was a diſciple of his brother Hubert, and a conſiderable painter; but above all things famous for having been the happy inventor of the art of painting in oil, anno 1440, thirty years before

printing was found out by John Guttemberg of Straſburg; he died anno 1441, having ſome years before his deceaſe communicated his invention to his ſiſter Margaret.

F.

F. B. ſtands for Francis Briccio of Bologna, painter; he engraved the pieces of Lewis Carracci.

F. B. B. father Bonaventura Biſi of Bologna, called il Padro Pittorino, or the painting friar.

F. B. V. I. ſignifies Frederic Barocci of Urbino, inv. he ſometimes, inſtead of the I put F, i. e. fecit.

The proportion of a man of ten FACES. From the top of the head to the ſole of the foot is divided into ten equal parts.

1. The firſt diſtance begins at the top of the head, and reaches to the root of the chin.
2. The ſecond, from thence to the throat-pit.
3. The third, from thence to the parting of the breaſts.
4. The fourth, from thence to the privities, which is juſt the middle of the length of the body.

From thence to the ſole of the foot are five ports more; two of which are between the privities and the mid-knees; and three more to the ſole of the foot.

The firſt of the ten parts, which is for the Face, is to be divided into three equal parts; the firſt beginning at the upper part of the forehead, and ending upon the upper croſs-line of the eye-brows.

The ſecond diſtance reaches from thence to the bottom of the noſe.

The third reaches to the bottom of the chin, which is the firſt and uppermoſt diviſion.

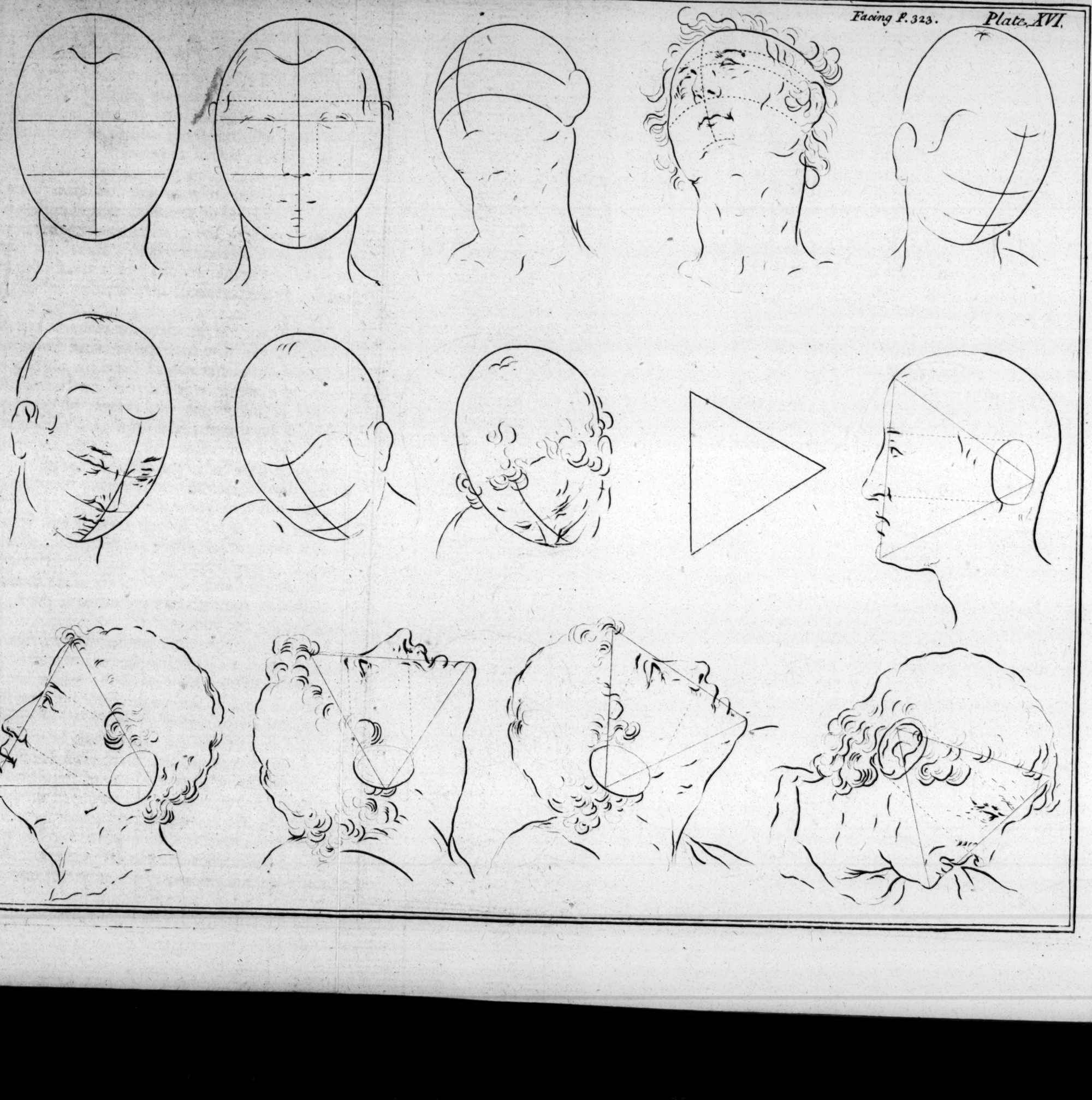
Now, in a foreright, be ſure to place the eyes the length of one eye diſtance from another; and the length of one eye the bottom of the noſe is to be.

The breadth of this body alſo conſiſts of ten Faces, viz. between the extremities of both the middle fingers, when the arms are extended or ſpread abroad; and it is thus divided.

1. The hand, from the end of the middle finger to the wriſt, is the length of a Face, or one of the tenth parts.
2. From the wriſt to the elbow, a Face and an half.
3. From the elbow to the ſhoulder joint, two Faces.
4. From thence to the throat-pit, one Face.

The hands have the proportion of one Face.

The nipples muſt be placed at the diſtance of a Face and an half



half from each other, equal to the diſtance between the wriſt and the elbow.

The compaſs of the head from the eye-brows to the neck behind, is double to the length of the whole head.

The compaſs of the waiſt is the diſtance of three Faces to the diameter of it, and is all one with the trunk of the body.

The circumference of the body under the armpits, and the ſpace between them and the wriſts, anſwer in a double proportion, and is agreeable to half of the body.

The proportions of a young man of nine FACES. A ſlender young body of nine heads is equal to nine times the ſpace between the top of the head and the end of the chin, that being a ninth part of the length of the whole body, and thence back again to the root of the hair a tenth or eleventh part. By which way ſoever you draw it, this ſpace is alſo divided into three equal parts, the firſt of which makes the forehead, the ſecond the noſe, the third the chin.

However, in a Face, for the eleventh part is a tuft of hair, which is uſually expreſſed, ſo that the forehead becomes lower by a third part; which rule the ancient Grecians always obſerved.

The proportions of a man of eight FACES. Firſt draw a ſtraight perpendicular line of the length you deſign the figure; divide this line into eight equal parts, the uppermoſt part of which is the length of the head, in which you muſt take care to be very exact, becauſe the whole body muſt anſwer in proportion to it.

Make that eighth part into an oval, dividing the oval into four equal ſpaces; the firſt is to be for the hair.

To draw a foreright FACE. In doing this it will be neceſſary to form a perfect oval, which divide in the midſt with a line, the longeſt way or perpendicular line; this line divide into three equal parts, allowing a fourth of one of the three parts for the hair on the forehead; the firſt for the forehead, the ſecond for the noſe, the third for the chin.

In the midſt of theſe form the mouth, always being ſure to make the eyes in one line; the croſs-line of the noſe and mouth muſt always correſpond with the croſs-line, where the eyes are placed, and the eyes muſt be the length of the diſtance from one eye to another; and their inward corners muſt be exactly perpendicular over the outſide of the noſtrils; but, to make the ears in a foreright Face proportionable, they muſt be much foreſhortened by fore-ſhortening; that is, the eye does not ſee the full latitude of it. The proportion of the length of the ear is to be from the eye-brows to the bottom of the noſtrils; and then join the neck with the hair, in ſuch a manner as may be moſt pleaſant to the eye. See the plates II, III, XVI, XXV, XXVIII.

If you would draw a Face after the life, that it may reſemble

the party you draw it after, take notice, in the firſt place, of the phyſiognomy or circumference of the Face, whether it be round or long, fat or lean, big or little, ſo that, in the firſt place, you muſt be ſure to take the right phyſiognomy and bigneſs of the Face; and, in caſe it be a fat Face, you will perceive the cheeks to make the ſide of the Face to ſwell out, and ſo make the Face look as if it were ſquare; and, if it be neither too fat nor too lean, it will be round for the moſt part; but, if it be a lean Face, the jaw-bones will ſtick out, and the cheeks fall in, and the Face will be long and ſlender.

But remember when you draw the outmoſt circumference of a Face, that you muſt take the head and all with it, or otherwiſe you may be deceived in drawing the true bigneſs of a Face.

You muſt likewiſe take a diligent obſervation of all the maſter touches, which give the ſpirit and life to a Face, and diſcover the grace or diſpoſition of the mind; wherein lieth the whole grace of the work.

You may eaſily diſcern a ſmiling countenance in the corners of the mouth, when they turn up a little: A ſtaid and ſober countenance may be diſcerned in the eyes, when the upper eye-lids come ſomewhat over the balls of the eyes.

A frowning countenance is eaſily diſcerned on the forehead, by the bending of the eye-brows, and ſome few wrinkles about the top of the noſe.

A laughing countenance is eaſily diſcerned all over the Face; and an angry countenance is diſcerned by extraordinary frowning; there are alſo ſome touches about the eyes and mouth, which muſt be diligently obſerved, which give life and ſpirit to a Face. See the plates of the various paſſions in their proper places.

The painting of a FACE. The cloth tablet, &c. being prepared, you muſt lay a ground or primer of fleſh colour, before you begin your work, and that muſt be tempered according to the complexion of the Face to be drawn; if the complexion be fair, temper white, red lead, and lake; if an hard ſwarthy complexion, mingle with the white and red a little fine maſticote or Engliſh oker.

But you muſt take notice of this, that your ground ought always to be fairer than the Face you take, for it is eaſy to darken a light colour, but difficult to lighten a deep one; for in limning you muſt never heighten, but work them down to their juſt colour.

Having prepared your ground colour, lay it on with a large pencil, as ſmooth, even, and free from hairs as poſſible, with a pencil full of colour, rather thin or wateriſh than thick and groſs, and with two or three dawbs of your great pencil lay it on in an

inſtant; the nimbler it is laid on, the evener the colour will lie.

You ought to cover rather too much than too little of your ground with this prime, than you ſhall uſe for the Face.

Having done this, take a pretty large pallet of ivory or other matter, and, before you begin to work, temper certain little heaps of the ſhadows for the Face, on the pallet with your finger.

The order of ſhadows for the FACE. In all your ſhadows mix ſome white; for the red, in the cheeks, lips, &c. temper lake, red lead, and a little white; for the blue, as the veins, &c. a little indigo and white; for the fainteſt and weakeſt colour or ſhades, lake and white, a little oker and a little indigo; and, if you pleaſe, a very ſmall quantity of pink or maſticote; for the deeper ſhadows, white Engliſh oker and umber; for the darkeſt and hardeſt ſhadows uſe lake and pink, mixed with umber.

Remember this, that you muſt by no means uſe black in a Face.

Theſe colours for ſhadows being thus prepared on your pallet, draw the lines of profile, i. e. the outmoſt ſtroke of a Face, with lake and white mingled very faint; by this you may conveniently mend the draught, if falſe, with a deeper mixture of the ſame colour; having drawn the lines exactly, and in true proportion, which is the chiefeſt thing of all, in the next place, obſerve the deeper and more remarkable ſhadows, and, with the ſame faint crimſon colour of lake and white, give ſome ſlight touches and marks, ſomewhat roughly, of theſe ſhadows, which you are to finiſh afterwards.

The order of drawing at the firſt ſitting. Firſt, you muſt only dead-colour the Face, as the oil painters do, and not meddle with the reſt, and this firſt ſitting commonly takes up two hours.

The dead-colouring of a Face is to be done the rougheſt and boldeſt of all; having drawn your Face with lake and white, as before, you muſt take to the ſaid colour a little red lead, tempering it to the colour of the cheeks, lips, &c. becauſe you cannot lighten a deep colour, without danger of ſpoiling the picture.

The firſt colour to begin the Face with, is the red of the cheeks and lips, ſomewhat ſtrongly the bottom of the chin, if the perſon be beardleſs; over, under, and about the eyes, you will perceive a delicate and faint redneſs, and underneath the eyes inclining to a purple colour, which in fair and beautiful Faces is uſual, and muſt be obſerved; the tip of the ear and the roots of the hair are commonly of the ſame colour.

All this you muſt do after the manner of hatching with faint and gentle ſtrokes, waſhing it all along.

In ſhort, in your dead-colouring, you muſt cover your ground with the aforeſaid red and the ſubſequent ſhadows.

You need not be over curious in your firſt working; but re-

gard a good bold following of nature, rather than ſmooth curioſity; the roughneſs of the colour may be mended at the next ſitting.

The ſecond ſitting. This commonly requires four or five hours, in which you are to go over the Face very curiouſly, obſerving whatever may conduce either to likeneſs or judicious colouring; alſo taking notice of the ſeveral graces, beauties, or deformities, as they appear in nature; or elſe in ſmoothneſs of ſhadows, or cloſe and ſweet touching the colours.

Having done the red, the next are the faint blues about the balls and corners of the eyes; and the grey and bluiſh under the eyes, the temples, &c. which you muſt work from the uppermoſt part of the Face almoſt all over, but exceeding ſweet and faint; ſweetening and heightening your ſhadows by degrees, as the light falls.

And in going over the Face be ſure to mark out the hard ſhadows in the dark ſide of the Face, under the noſe, chin, eyebrows, &c. as the lights fall, and ſomewhat ſtrong touches; in thoſe bring up your work together in an equal roundneſs, not giving perfection to any particular part of the Face; but viſiting all the parts curiouſly, and in a kind of random manner; by which means you will better perceive the likeneſs, roundneſs, poſtures, colouring, or whatever elſe is requiſite to the perfection of your work.

The party being ſet juſt in his former ſeat, you muſt moſt exactly obſerve, and curiouſly delineate with your pencil thoſe ſeveral varieties of nature, which you did rudely trace out before, working, drawing, and ſweetening the ſame colours into one another, to the end that nothing be left in your work with a hard edge, uneven, or a lump together; but alſo ſo ſwept and driven one into another, with the point of ſomewhat a ſharper pencil than that at firſt uſed, that the ſhadows may lie ſoft and ſmooth, being diſperſed and gently extended into all; and, towards the lighter parts of the Face, like air or a vapoury ſmoak; but, before this, you muſt carefully obſerve all the ſhadows and colours.

In the next place go over the hair, heightening and deepening it, as you ſhall ſee by the life, drawing ſome locks looſely over the ground, which would otherwiſe ſeem unpleaſant.

To ſhadow linen uſe black, white, a little yellow and leſs blue; the black muſt be deepened with ivory-black, with which mix a little lake and indigo, or litmoſe-blue.

The third ſitting. The third ſitting commonly takes up two or three hours, and is ſpent in cloſing what was before imperfect and rough; but principally in giving to every deep ſhadow the ſtrong touches and deepenings, as well in the dark ſhadows

in

in the Face as in the eyes, eye-brows, hair, and ears; and theſe touches are ever the laſt part of this buſineſs, and are never to be done, till all the hair and drapery are finiſhed; theſe touches, if well done, add exceedingly to the life.

Having done the fainter or lighter ſhades, and ſomewhat ſmoothed and wrought them into red, you may go over the hair, diſpoſing it into ſuch forms, folds, or tramels, as may beſt become the picture.

You muſt at firſt only draw them with colour, as near as you can ſuitable to the life, and after waſh them lightly at the firſt, and then once more peruſe your work, carefully filling up the void, empty, and bare places which are uncovered with colour; and at laſt deepen it ſomewhat more ſtrongly than before in the deepeſt ſhady places; ſtill carefully obſerving the life, and after this do your ground, &c. See GROUND.

The third ſitting, as has been ſaid, will be wholly taken up in giving the ſtrong touches, and making the obſervations neceſſary for rounding the Face, which will be better ſeen how to do; after the apparel, hair, and ground are finiſhed at the third ſitting, you muſt curiouſly obſerve whatever may conduce to likeneſs, as ſcars, moles, &c. glances of the eyes, deſcending and circumflexions of the mouth; but never make your deepeſt ſhadows ſo deep as they appear in the life.

After you have done your ground, lay your linen with a flat white, and the drapery likewiſe flat. See DRAPERY; then go over your Face again, endeavouring to reduce each ſhadow to its true perfection; then draw the lines of the eye-lids, expreſſing the red-dark noſtril, the ſhady entrance into the ears, the deepneſs of the eye-brows, and thoſe more perſpicuous notes and marks in the Face with a pencil ſomewhat more curious and ſharp than before; you may darken your ground as you ſee will be moſt advantageous for the ſetting off the picture.

FADINGNESS, is repreſented, in painting, by a lady clad in green, her garment all embroidered with pearl and precious jewels, with a golden crown in one hand, a lighted torch with this motto, egrediens ut fulgur, in the other, and a noſegay of roſes, part of which fall to the ground, fading and diſcoloured. The roſe in the morning buds, is fragrant and flouriſhing, and in the evening languiſhes and fades, a true emblem of the frailty of ſublunary things.

FAITH, is repreſented, in painting, by a woman cloathed in white garments, holding in her hand a cup of gold.

William FAITHORN, was a diſciple to Mr. Peak, painter to prince Rupert; after the civil wars broke out, he went into the army, and being taken priſoner in Baſing-houſe, and refuſing to take the oaths to Oliver, was baniſhed to France; where he

ſtudied ſeveral years under Campagne, a famous painter of that time, and arrived to a very great perfection in correctneſs of drawing. He was alſo a great proficient in graving, as likewiſe in painting in miniature, of which there are many inſtances now in England; he died in Black-friars, about the beginning of king William's reign, and there was buried, near ſeventy-five years of age.

FAME, is painted like a lady, with great wings, and ſeeming to proffer a flight, and to mount from the earth, and to rove abroad, having her face full of eyes; all over her garments are an infinite number of ears and tongues.

She is alſo repreſented as a lady clad in a thin and light garment, open to the middle thigh, that ſhe might run the faſter; two exceeding large wings; garments embroidered with eyes and ears, and blowing a trumpet.

She is likewiſe repreſented by a curious figure of a naked Mercury, with a cloth over his left arm, and his rod in his hand, holding Pegaſus by the bridle, capering as if he would fly away.

Mercury denotes Fame, for he was meſſenger to Jupiter; as alſo the efficacy of ſpeech and a good voice, that ſpreads and is diffuſed; Pegaſus denotes that Fame is carried by ſpeech, that ſounds the actions of government.

Paolo FARINATO, born in the year 1522, ſcholar to Nicolo Golfino, lived at Verona and Mantua, excelled in hiſtory, ſculpture, and architecture, died in 1606, aged eighty-four years.

FASTING, is repreſented, in painting, by a man pale and meagre, in a white antique dreſs; he is muzzled, his eyes lifted up to heaven, his right arm extended, and in his hand is the fiſh bull-head; on a ſcroll is written Pauco veſcor, a hare under his left arm, and he treading upon a gaping crocodile.

His paleneſs demonſtrates the effect of Faſting, the white raiment denotes his ſincerity, not only to abſtain from food, but alſo from vice; looking upwards, that his mind is not offuſcated with meat; the fiſh lives upon his own moiſture, and eats little, as the motto declares; the crocodile, voracious and an enemy to faſting, therefore he treads it under foot; the hare intimates vigilance.

FATE, is repreſented as a man clad in a fair, long, flaxen robe, looking upwards to two bright ſtars, encompaſſed with thick clouds, from whence hangs a golden chain.

FAUNS. } SYLVANS. } SATYRS. } These and fairies were repreſented much in the ſame form as Pan, having little ſhort horns growing on their heads, with ſmall ears and ſhort tails.

FEAR, is an apprehenſion of an evil to come, fore-running the evils with which we are threatened.

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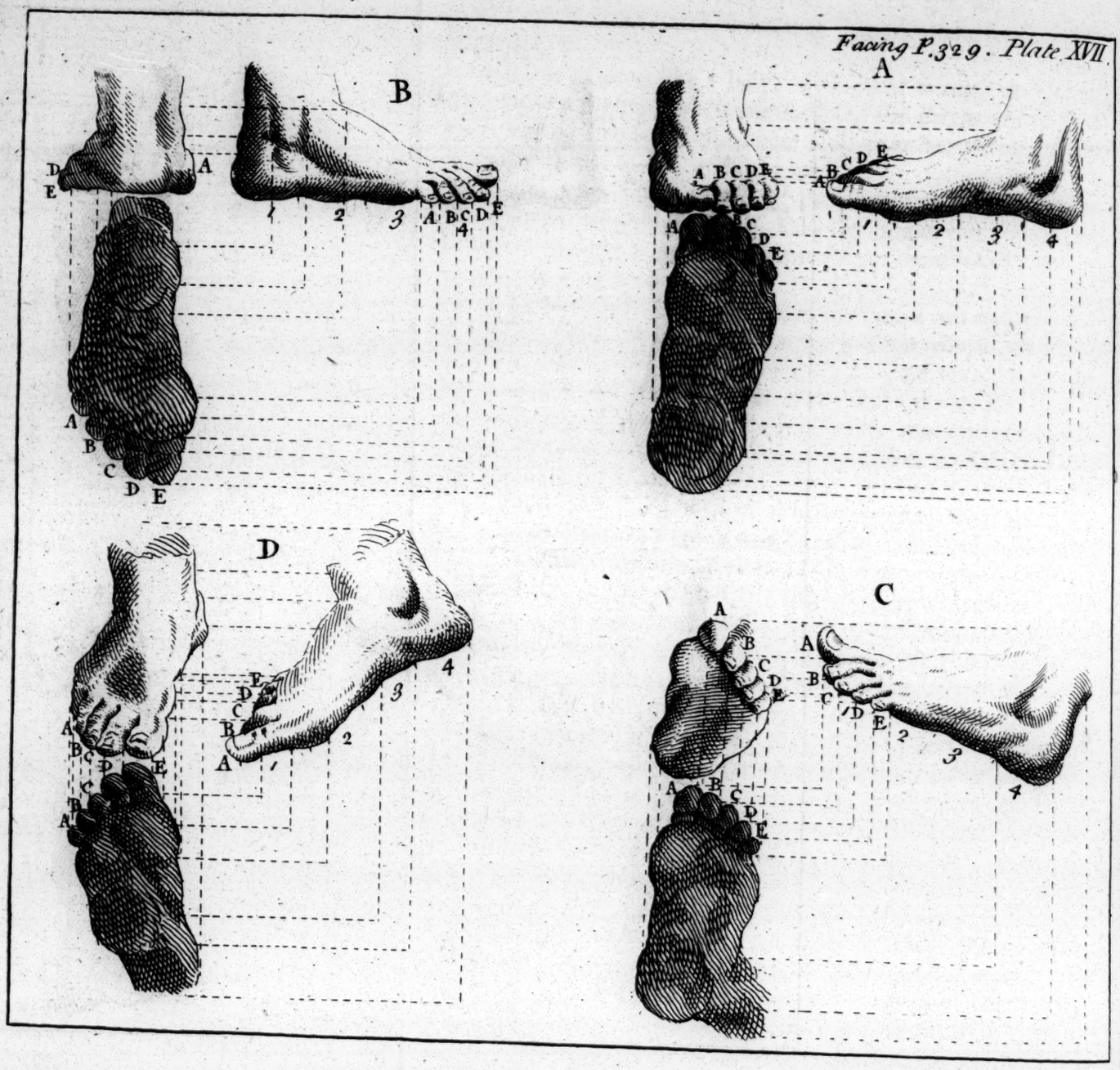
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But, if there be no appearance of obtaining what we deſire, then, inſtead of hope, comes Fear or deſpair. The motion of Fear is expreſſed in drawing, &c. by the eye-brow a little raiſed next the noſe; the ball ſparkling in an unquiet motion, and ſituated in the middle of the eye; the mouth open, being drawn back, and more open at the corners than in the middle, having the under lip more drawn back than the upper; the complexion redder than even in love or deſire; but not ſo beautiful, inclining to livid, with the lips of the ſame colour and dry.

Fear, ſometimes, may have motions reſembling thoſe of terror, being only cauſed by an apprehenſion of loſing ſomething, or that ſome ill ſhould befal us; this paſſion may give motions to the body, which may be repreſented by the ſhoulders preſſed together, the arms and hands drawn cloſe to the body; and the other parts gathered together and bended, expreſſing as it were a trembling.

FEBRUARY, is drawn in a dark ſky colour, carrying in his right hand the character of the ſign of the zodiac, called Piſces.

F. C. ſtands for Franceſchino Caracci of Bologna, younger brother to Auguſtin and Hannibal.

FEET. For drawing Feet there is not ſo much difficulty as in that of hands, and, in drawing them, you muſt proceed the ſame way that is ſhewn for drawing of hands. See the proportions, plates XVII. and XVIII.

To foreſhorten Feet ſeen forwards, you muſt make the foot aſide with its proportions and meaſures on the inſide of the foot marked A, and, from theſe proportions and meaſures marked 1 2 3 4, draw down perpendiculars until you cut the diagonal, and continue thence lines parallel, to make the ſhadowed Foot under the place of the foreſhortened Foot, and from the ſaid ſhadowed Foot you muſt raiſe perpendiculars unto the place of the ſaid Foot to be ſhortened, which, there meeting with the level lines that proceed from the firſt Foot by interſection of them, gives us the ſaid Foot geometrically foreſhortened, as here repreſented. The toes of the Feet are marked A B C D E, and the like is to be obſerved for the Foot ſeen by the heel marked B, and alſo for the Foot marked with C ſeen on the fore-part; and, laſtly, in like ſort for the Foot marked with D, are foreſhortened by the ſame rule as the former.

FELICITY, is repreſented as a lady, ſitting on an imperial throne, holding in one hand a caduceus or rod, and in the other hand a cornucopia.

How to make FRET *work cielings.* Take pebbles, pound them fine in an iron mortar, ſearce them through a fine hair ſieve; then take of powdered lime, one part; of the pebble powder, two parts; and mix them together with water; then take the mixture

mixture and lay it all over the cieling very ſmooth; carve then on it what you pleaſe, or lay to it ſome ornament with moulds, which are cut in ſmooth wood or caſt in lead; fill the mould with the mixture, preſs it to the cieling, and it will ſtick and come clean out of the mould; let it dry; when dry, and you perceive that it is not every-where of a good white, then, with a clean pencil, bruſh, and clear water, ſtrike it over, and it whitens of itſelf. It will, in time, grow as hard as ſtone.

To make FERETTO *of Spain, for tinging of glaſs.* The name Feretto comes from the Italian and Spaniſh, and is ſo called becauſe it is found in iron mines; and commonly Feretto of Spain, becauſe the moſt part of what was ſold in other parts of Europe, and which was the beſt, was found in thoſe mines, and comes to us from thence.

There is ſome of it black, like iron, and which communicates its colour to the matter, in which it is uſed, which is the reaſon it ought to be choſen; for good Feretto is known by its being red; and, being beaten, imitates the colour of cinnabar, which it always does, when it is pretty well calcined.

Pomet, in his hiſtory of drugs, ſays, that the lapis hæmatites is what we commonly call the Feretto of Spain; that this mineral is of a reddiſh colour, hard, weighty, and pointed with long and ſharp points; that it is brought from ſeveral places, foraſmuch as there are no iron mines in which it is not found.

That the name hæmatites is given it of haima, which ſignifies blood, becauſe this ſtone is good for ſtopping of blood; and it is called the blood-ſtone, becauſe it is of the colour of blood; and Feretto, becauſe it is found in iron mines.

Although Feretto be found in mines, yet it may be artificially made much better.

Excellent Feretto uſed to be made anciently in Cyprus, and at Memphis, the metropolis of Egypt; but it is not now in uſe, as formerly.

Neri and Merret, who have written of the art of glaſs, uſe only copper or braſs for making of Feretto; but true Feretto cannot be made without iron or ſteel.

An ordinary way of making FERETTO *is this.* Take filings of iron very clean, and ſulphur beat to powder; put them in a crucible, layer over layer, or firſt one layer of ſulphur, then one of filings, and ſo on; beginning and ending with the ſulphur, which is called ſtratification, or ſtratum ſuper ſtratum. Cover the crucible with another, or with a tile, and lute it cloſe, and ſet it into a furnace with coals round it for ſix hours, increaſing the fire every two hours; that is, for the two firſt hours, let the fire or coals be half a foot from the crucible, the two ſecond about

about a quarter of a foot, and the two laſt let it be covered all over with coals.

Another extraordinary way of making FERETTO *of Spain, which is a great ſecret.* This way of making Feretto is not common, nor much known; it is of a very wonderful uſe, not only for tinging glaſs, but for ſeveral chemical operations, eſpecially if a ſecond and farther preparation be made of it. But, as for that for tinging glaſs only,

Take very fine ſteel, for all the excellency of the work conſiſts in the perfection of that; make it into thin plates, or file it; alſo do the ſame with copper or braſs, viz. make that alſo into thin plates, or take the filings, one part to two of ſteel; put them into a crucible ſtratum ſuper ſtratum, lute them, and put it on a gentle fire for eight hours; then take it out, and melt the whole in a wind furnace; then caſt it into a lingot, or in little plates, and the buſineſs is done.

To make uſe of this in glaſs, you muſt calcine theſe plates; then pound them and ſearce them, and keep that powder in a pot cloſe ſtopped for uſe.

The way of making FERETTO, *of only copper, for tinging glaſs.* Neri and Merret give the name of Feretto of Spain to the following preparation, aſſerting, that it communicates ſeveral very fine colours to glaſs.

Take thin plates of copper or braſs, cut them into pieces, and put them into a crucible, in the bottom of which you have laid a bed of ſulphur pulveriſed; then a layer of copper; then another of ſulphur, which you muſt thus continue ſtratum ſuper ſtratum till the crucible is full.

Then cover the crucible with another, or with a tile, and lute it well, and dry it, and put it into a furnace among hot coals in a good briſk fire for the ſpace of two hours; then take out the crucible, let it cool, and you will find the copper or braſs calcined, which will break and crumble between yours fingers like dry earth, of a blackiſh colour.

This is to be pounded in a mortar to a fine powder, ſearced, and kept in a veſſel well cloſed for uſe.

Ciro FERRI, born in the year 1628, ſcholar of Peter Cartona, lived at Rome, excelled in hiſtory and architecture, died in the year 1690, aged ſixty-two.

FESTOON, a garland or ornament of flowers, fruits, and leaves intermixed; anciently much uſed at the gates of temples, where feaſts or ſolemn rejoicings were held; or at any other places where marks of public joy and gaiety were deſired, as at triumphal arches, tournaments, &c.

Domenico FETTI, born in 1589, ſcholar of Ludovico Civoli, and ſtudied Julio Romano; lived at Rome, Mantua, and Venice,

Venice, excelled in hiſtory, died in the year 1666, aged ſeventy-ſix years.

FEVER, is repreſented, in painting, by a young woman meagre and pale, having black hair, hot vapour iſſuing out of her mouth, a lion at her feet, very melancholy, holding one hand upon her heart, and in the other the chain of a ſlave inſcribed, Membra cuncta fatiſcunt.

She is young, becauſe young perſons are moſt ſubject to Fevers; her mouth open ſignifies the included heat wants vent; the lion denotes a Fever, becauſe he is always in one; the chain ſhews, that it affects all the parts by the arteries diffuſed through the members.

Le FEVRE *de Veniſe*, was a French hiſtory-painter, who came into England in the reign of king Charles II. He was better at deſigning, as appears by his work, than for painting; he had a particular excellence in ſtaining marble, which he did ſeveral times for prince Rupert. He died in London about forty-five years ago, and lies buried in St. Martin's Church.

FF *Odoardo* FIALETTI *fecit.* A painter and engraver of Bologna, uſed this mark.

FIDELITY, is repreſented, in painting, by a woman cloathed in white, with a ſeal in one hand, a key in the other, and a white dog by her.

The key and ſeal denote fidelity, becauſe they lock up and conceal ſecrets; the dog is the moſt faithful animal in the world, and beloved by men.

FIELDS, *hills*, and *mountains*. 1. Fields that lie near muſt be done with a ſingular good green, the which muſt always be fainteſt, according as they fall off to a farther diſtance; heightening them with maſticote or light green, and ſhadowing with ſap green, but not too much.

2. Thoſe which lie far off are to be laid with a French berry yellow, made of a greeniſh blue, ſhaded with oker.

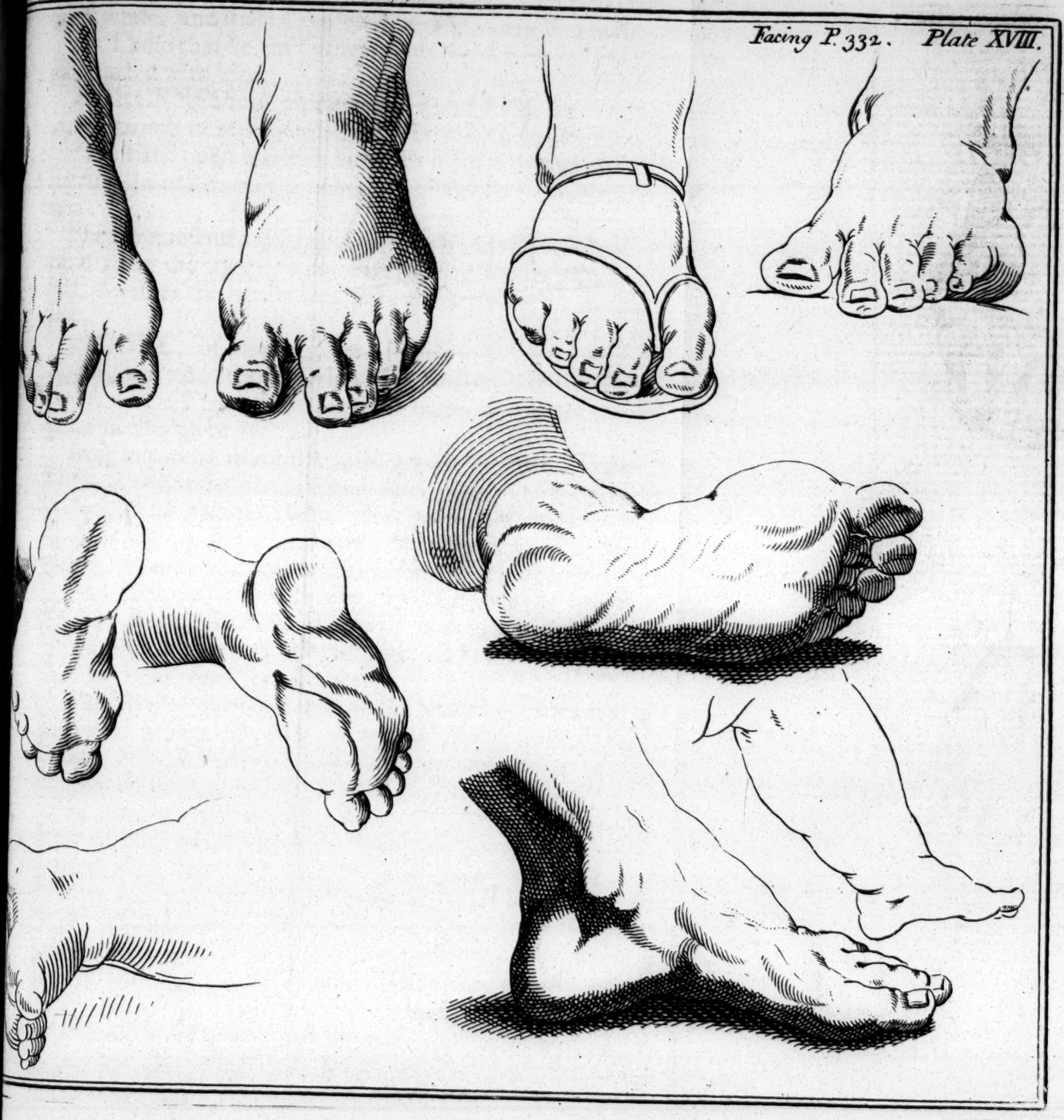
3. And in Fields, hills, and dales, whether near or far off, there are many roads, paſſages, and ways, which muſt be laid either fainter or ſtronger, according to their diſtance and ſituation.

4. Thoſe mountains which are next in ſight are to be laid with a fair green, and ſhaded with ſap green; ſometimes with brown oker and French berries, to diſtinguiſh them from ſuch as are far off.

5. Such as lie farther off are to be done with green, blue, and maſticote, and ſhaded with blue, green, and verdigreaſe.

6. Such as lie yet farther muſt be laid with ſome ſtrong blue, white, and Bergh green, and ſhaded with ſtrong blue.

7. Thoſe





7. Thoſe which lie yet farther off muſt be done with ſome ſtrong blue and white, and ſhaded with blue only.

8. Thoſe that lie at ſtill a greater diſtance are to be laid only with white, and ſhaded with a faint bice.

9. Thoſe that lie yet farther off are done with bice and white, and ſhaded with bice.

FIERCENESS, is repreſented, in painting, by a young woman ſeeming to be beſides herſelf, breathing out threats, laying her left hand upon a tiger's head, as if ſhe was a going to ſtrike, holding an oaken cudgel in her right hand in a threatening manner.

She is repreſented young, and therefore undaunted; her right hand upon the tiger denotes Fierceneſs and cruelty; the oaken club ſignifies the hardheartedneſs of ſavage men, Duro robore nati.

FIGURE, in painting, &c. ſignifies the lines and colours which form the repreſentation of a man or other animal; thus it is ſaid of a Figure, this Figure is lame, and there are fifty Figures in this piece.

But, in a more immediate and peculiar manner, Figure is underſtood of human perſonages; thus, a piece of painting is ſaid to be full of Figures, when there are a great many repreſentations of men; and a landſcape, wherein is nothing but trees, plants, mountains, &c. is ſaid to be without Figures.

And ſo likewiſe, in ſculpture, we ſay Figures of marble, braſs, plaiſter, ſtuck, &c. but chiefly of human repreſentations, and but rarely, if ever, to other things. Thus we call a man on horſeback an equeſtrian Figure.

But Daviler obſerves, that thoſe human Figures that are repreſented ſitting, kneeling, or laid all along, as thoſe on monuments, &c. and rivers perſonified, are more properly called Figures than ſtatues.

To colour naked FIGURES, as, 1. Women and children. Mix the beſt flake white lead and a little good lake, and, if you pleaſe, a little vermilion; but take care that the mixture be neither too red nor too pale, but as agreeably as poſſibly can be to the life itſelf. When this is dry, touch the lips, cheeks, chin, fingers, and toes, with thin lake, and then heighten with white mixed with a little lake or vermilion. If you would cover them ſomewhat browniſh, mix with your carnation a little brown oker, and ſhade it with red oker and coal-black with a little lake.

2. For old women, uſe white, vermilion, and brown oker; and, where the luſtre ought to be, give it with vermilion mixed with a little lake. Give the ſhade with red oker and lake, or with wood-ſoot or lamp-black; and heighten with white, mixed with a ſmall quantity of vermilion.

3. Paint

3. Paint dead children and young women with brown oker, white, and ſome vermilion; and ſhadow with the ſoot of wood.

4. Colour dead old women with brown oker mixed with a litle white; ſhade firſt with a thin wood-ſoot, and afterwards with a ſtronger.

5. Paint young men with ceruſs, vermilion, and lake, making it a little browner than for young women, giving them luſtre with vermilion and lake, and ſhadowing with lamp-black and brown oker, and heightening with ceruſs and vermilion.

6. Limn old men with vermilion, brown oker, and white; ſhade with ſoot and lamp-black; heighten with vermilion, brown oker, and white; and give a luſtre with lake or vermilion.

7. Colour dead men with brown oker, white, and a little vermilion, with diſcretion; ſhade with ſoot or lamp-black, mixed with a litle ceruſs.

8. Colour devils, ſatyrs, or the like with brown oker, mixed with a little white and red; and make this mixture, ſome part of it white, and ſome part of it browner, ſhading it ſtrongly with ſoot, according to diſcretion.

To dye a FILLEMOT. Firſt, let the ware be dyed yellow; then paſs it through the black hot dye, and when it is cool rinſe it, always remembering, that the lighter the yellow the lighter will be the Fillemot; then having ſet fair water over the fire, put in half an ounce of braſil wood; let it boil for a quarter of an hour, and then paſs the ware through it.

To dye a deep FILLEMOT. For twenty-eight pounds of wool, take ten ounces of galls, and a pound of ſucette or virette wood, half a pound of madder, and two ounces of gum gutta; boil the dye, and ſtir the ware in it, till the dye hath penetrated it ſufficiently.

If you would have it brighter, then take but ſix ounces of galls, and ſix ounces of madder; and add a quarter of a pound of verdigreaſe.

Or elſe, take half a pound of ſucette wood, a quarter of a pound of galls, and one ounce of madder, and one ounce of vitriol.

To dye a light FILLEMOT, take a quarter of a pound of galls beaten ſmall; boil them an hour and an half in a pail of water; then put in a quarter of a pound of vitriol, a handful of ſoot beaten ſmall, and ſo put the yellow ſilks into it, till it grows dark enough; then rinſe it and dry it.

Crimſon FILLEMOT. Fill a well cleanſed kettle half full of water, and for every pound of ſilk take half a pound of yellow wood, which boil in a bag in the water for ſome time; then add one pound of galls, and fill up the kettle with ſtale, or old gall water; then take the ſilks off the poles; they having been

firſt boiled, alumed, and rinſed, put them into the kettle, and boil them for an hour; then ſoak them in the liquor a whole night, and in the morning wring them out, rinſe, and beat them; and afterwards brown them a little, till they become ſufficiently deep.

To dye ſilk a FILLEMOT. Firſt dye the ſilk in the laſt-mentioned yellow; then, for every pound of ſilk, take a quarter of a pound of blue Provence wood; boil it in a bag as uſual for half an hour, in the quantity of a pail of water; take the bag out, and let the ſuds ſtand to cool, till you can juſt bear your hand in it; then lay the yellow ſilk to ſoak in it for a full hour; then take it out, and boil a ſufficient quantity of powdered ſoot in half a pail of water for half an hour, and afterwards put in the ſilk: When it is taken out, let it be rinſed in a good ſtrong ley of wood aſhes, and after that in river water, and then hang it out to dry.

An excellent invention to make a pleaſant coal FIRE. Take of the beſt Newcaſtle coals, pounded ſmall, three parts; loam one part; mix them well together into a maſs with water; make them up into balls, and dry them well. This fire is durable, ſweet, and not offenſive, by reaſon of the ſmoak or cinders, as other coal fires are; but burns as well in a chamber as charcoal itſelf.

FIRE *and flames*, in miniature, are coloured, the lights with maſticote and orpiment; and, for the ſhades, vermilion and carmine.

FIRE-*Works*. See PYROTECHNY.

To dye ſilk of a FIRE *colour*. Alum your ſilk; then tie up half a pound of braſil in a bag to each pound of ſilk, and lay it in liquor for half an hour; then take it out, and put in an ounce of beaten turmeric; let the dye diſſolve, and when it is cold take out the ſilk, and put the bag in again with ſome ley; boil it again, and then take out the bag, and put in the ſilk, leaving it in till it is cold; then rinſe and dry it.

To dye a FLAME *colour*. It being firſt dyed yellow, boil two ounces of fuſtel wood, and an ounce of pot-aſhes, for every pound of woollen ſtuffs, for half an hour; ſtir it very well, and then put in the ſtuffs; work it till the colour is to your mind; then rinſe it out.

To dye ſilk a FLAME *colour*. Firſt boil, rinſe, beat, and dry the ſilk, and for every pound take two ounces of Orleans, diſſolve it in warm water, and wave the ſilk to and fro in it till it is juſt ready to boil, which it muſt not be ſuffered to do; then rinſe and beat the ſilk; and afterwards, to every pound of ſilk, take ſix pounds of wild ſaffron, prepared as directed in the Spaniſh fleſh colour, or in carnation, four ounces and an half of pot-aſhes,

two

two quarterns and an half of lime juice; all which muſt be prepared as in the pearl and flame colour.

AB *Albert* FLAMEN, in certain plates of birds, beaſts, and fiſhes, made this mark.

Alexander Badiali, a painter and engraver of Bologna; and Another Boſs, a native of France, alſo uſed this mark.

FLATTERY, is repreſented, in painting, by a woman in an affected wanton habit, playing upon a flute; a buck at her feet faſt aſleep, with a bee-hive by her ſide.—The buck denotes flattery, becauſe he is ſo charmed with muſic that he lets himſelf be taken; the bees are a true emblem of it, carrying honey in their mouth, and a ſecret ſting in their tails.

To dye woollen ſtuffs, &c. a FLESH *colour.* Firſt boil the ſtuff or cloth for two hours, in a liquor, made with a pound of alum, a pound of calcined tartar, four ounces of ceruſs, and three ounces and an half of arſenic; then take it out, leaving the ſuds over the fire; and the next morning prepare a liquor, made with two pounds of good leather ſhreds, a quarter of a pound of Orleans, two ounces of turmeric, and an ounce and an half of aqua-fortis.

Another. Boil the cloth, for an hour, in a liquor made with three pounds and an half of alum, four ounces of ceruſs, and three ounces of arſenic; pour off the water, and rinſe the ſtuff in running water, and then make a liquor of eight pounds of madder, and two ounces of ſal armoniac; let them lie a night to diſſolve; then boil them a little, adding one ounce of pot-aſhes; then pour ſome of this upon the ſtuff in the other kettle; and, as often as it is poured on, ſo often you dye, ſo that you may leave off when it is light dyed, or deepen it as you pleaſe; and, if you would have it very deep, mix with the pot-aſhes an ounce and an half of borax, and that will alſo give it a beautiful luſtre.

A paler FLESH *colour.* This dye muſt be made juſt as the laſt, except that there muſt be but half the ſame quantity of ingredients, and that without any galls.

A Spaniſh FLESH *colour.* For every pound of ware, take two ounces of tartar, a quarter of an ounce of cochineal, a quarter of an ounce of ſtarch, to which add half an ounce, when the former has been a little while in the ſuds.

Then, having diſſolved two ounces of filings of tin in three ounces of aqua-fortis in the ſunſhine, put the cochineal into the liquor by degrees; and, when it boils, put in the aqua-fortis, and, a little after that, put in the goods to be dyed, adding a quarter of an ounce of cream of tartar, or the moſt ſubtile tartar; half an ounce of ſtarch, half an ounce of lemon juice, and half an ounce of cochineal; boil for a quarter of an hour, or as you ſee occaſion.

To dye an incarnate or FLESH *colour in grain.* Take ſtale liquor, made with fair water and wheat bran, or ſour tap-wort, being very clear, a ſufficient quantity; alum bruiſed two pounds and an half, red tartar bruiſed ſmall one pound; boil all together, and enter twenty yards of broad cloth; boil and handle it well for three hours, after which cool your cloth, and waſh it well; then take freſh bran liquor made of a peck of bran, the clear liquor a ſufficient quantity, grains of kermes four ounces, dried in a pewter diſh before the fire, and made into a fine powder; red argol in powder four ounces; mix all theſe three things together, and make them boil; enter your cloth, and handle it, boiling it three quarters of an hour ſtrongly, and keeping the cloth under the liquor; then cool and waſh it well.

Another incarnate or FLESH *colour, called a raſberry red.* Take bran liquor a ſufficient quantity, alum three pounds; boil for three hours; then add madder four pounds, braſil ground four ounces, alum one ounce, freſh bran liquor a ſufficient quantity; boil, and then enter twenty yards of camblet ſtuff, but not boiling; keep it in two hours, take it out and waſh it well.

To dye linen or fuſtian of a FLESH *colour.* For every pound of linen, put two ounces of baſtard or wild ſaffron in a bag, and lay it all night in the quantity of a pail of water to diſſolve; throw away this water, and take another pail of water, and, having taken the ſaffron out of the bag, rub it well betwixt your hands, and wring it clean out of the water; filtre the liquor that none of the ſaffron be loſt, and then throw it away; repeat this operation as long as the ſaffron leaves any yellow tincture, and then wring it out dry with your hands.

Then take a little ley made with good beech aſhes, heat it, and put it to your thus prepared ſaffron, letting it lie and ſteep for five or ſix hours; then wring it out, and, that none may remain, filtre the ley through a hair ſieve; then throw away the ſaffron, and add to the ley an equal quantity of beer vinegar; ſtir it about very well, and put in your pound of linen, letting it lie in the liquor for three or four hours, and then rinſe it clean out, and it will be of a very good crimſon Fleſh colour; but you muſt take care to ſtir the linen often about, to prevent its being flaked and unequally dyed.

To dye ſilk the beautiful Spaniſh FLESH *colour or carnation.* Firſt prepare and alum your ſilk as for crimſon; and for every pound of ſilk take four pounds of wild ſaffron, which put into a thick bag; throw it into ſeveral waters, and work it ſo long till the water comes from it clear; then take the ſaffron out of the bag, ſqueeſe and rub it with your hands till it is dry, putting it into another veſſel; afterwards, for every pound of ſilk, take a quarter of a pound of pot-aſhes, and rub them well into

the ſaffron in a clean veſſel; and after that, if it be neceſſary, it may be rubbed again.

When all this has been done, divide the ſaffron into two parts, and take a bag ſo thick that the pot-aſhes cannot get through, when it is tied up; put one part of the ſaffron into this bag, and pour clear water upon it in the kettle, till the ſtrength of the ſaffron is boiled out; then, for every pound of ſilk, take half a pint of lime juice, and divide that alſo into two parts, and to each part of ſaffron add one part of lime juice; then take the dry ſilk, and ſtir it up and down in the kettle, in which the looſe part of the ſaffron is, for the ſpace of an hour; then let it be very well wrung, and paſſed through the kettle where the bag is, and for an hour continually ſtirred; then let it be wrung out, and dried in a dark place, and not in a clear light, and it will be of the beautiful colour deſired..

To make FLOCK *cloth hangings.* Spread coarſe canvaſs upon an even floor or table, and having flocks or ſhreds of woollen ground as ſmall as duſt, and the cloth being ſized over with good ſtrong ſize, while it is wet, ſift the Flocks through a fine ſieve, which when you have done, run a roller of wood or iron over the piece to preſs them down cloſe, and ſo ſuffer them to dry in the ſhade, leſt the ſun or fire parch them or make them crack; and, when they are dry, bruſh them over lightly with alum water, and ſo draw your deſign with black and red lead, charcoal-black, or any other colour; and it will at a diſtance look like tapeſtry, and be very laſting in a room where no great fires are made.

FLORA, the goddeſs of flowers, is repreſented in a black mantle.

Francis FLORIS, born in the year 1520, ſcholar of Lambert Lombard, and ſtudied Michael Angelo; lived at Antwerp and in Italy, excelled in hiſtory, died in the year 1570, aged fifty years.

FLOWERS. It is moſt delightful to paint Flowers, not only becauſe of their luſtre, but alſo becauſe they take up but little time to do them; for it is all pleaſure and no trouble. You ſpoil a face if you make one eye a little higher than the other, if you make a ſmall noſe or a large mouth, and ſo on of the other features: But the fear of theſe proportions never troubles the mind when you are about Flowers; for, except they be quite out of the way indeed, you ſpoil nothing, and accordingly moſt of the quality, who apply themſelves to painting, concern themſelves with nothing but Flowers. You muſt however learn to copy a little exactly; and for this branch of miniature, as well as for the reſt, I refer to nature as your only guide; work then after natural Flowers, and ſearch for their tints and various co-

lours upon your pallet: A little practice will eaſily bring you to be expert in this; and, in order to pave the way for you at firſt, I have ſhewn how to paint each under its proper article.

FOLIAGE, a cluſter or aſſemblage of flowers, leaves, branches, &c. It is particularly uſed for the repreſentations of ſuch flowers, leaves, branches, rinds, &c. whether natural or artificial, uſed as in inrichments on capitals, frizes, pediments, &c.

FOLIATING } *looking-glaſs plates.* The plates, having been
SILVERING } poliſhed, are next to be foliated or ſilvered, which is performed after the following manner:

A thin blotting paper is ſpread on a table, and ſprinkled with fine chalk; and then a fine lamina or leaf of tin, called foil, is laid over the paper; upon this mercury is poured, which is to be equally diſtributed over the leaf with a hare's foot or cotton: Over the leaf is laid a clean paper, and over that the glaſs plate. —The glaſs plate is preſſed down with the right hand, and the paper is drawn gently out with the left; which being done, the plate is covered with a thicker paper, and loaded with a greater weight, that the ſuperfluous mercury may be driven out, and the tin adhere more cloſely to the glaſs.—When it is dried, the weight is removed, and the looking-glaſs is complete.—Some add an ounce of mercury to half an ounce of marcaſite, melted by the fire; and, leſt the mercury ſhould evaporate in ſmoke, pour it into cold water, and when cold ſqueeſe it through a cloth or leather.—Some alſo add a quarter of an ounce of lead and tin to the marcaſite, that the glaſs may dry the ſooner.

FOLLY, is repreſented, in painting, by a perſon at man's eſtate, in a long black garment, laughing, riding upon a hobby horſe, holding in one hand a whirligig of paſteboard, and playing the fool with children, who make him twirl it by the wind.—Folly is only acting contrary to the due decorum and common cuſtom of men, delighting in childiſh toys and things of little moment.

FORCE *of eloquence*, is repreſented, in painting, by a woman in a decent grave habit, holding Mercury's rod in her hand, and a lion under her feet.—This demonſtrates, that Force and ſtrength give place to the eloquence of thoſe whoſe tongues are well hung; for we perceive the unruly mob, though threatening deſtruction, are preſently appeaſed, and lay down their arms, as ſoon as they hear a grave eloquent perſon demonſtrate the danger of the riot; their boiſterous huzza's are all on a ſudden huſhed into ſilence, and they tamely ſubmit to his dictates.

FORCE *of juſtice*, is repreſented, in painting, by a lady in royal apparel, crowned, about to ſit down upon the back of a lion, and ſeems to lay her hand upon her ſword, which denotes

juſtice, as the lion does ſtrength; ſo that the ſtrength of the latter ſubmits to the former, i. e. juſtice.

FORCE *of love*, is repreſented, in painting, by a naked ſtripling, reſembling Cupid, ſmiling, with wings on his ſhoulders, holding a dolphin in one hand, and a garland of flowers in the other, to ſhew the power of love both by ſea and land through the univerſe.

The empire of Cupid is ſometimes imitated by his ſitting in a chariot, drawn by two lions, with his hand held up towards heaven, from whence fall arrows and flames, that give place to none, for Jupiter is not exempt from them.

FORCE *of virtue*, is repreſented, in painting, by a very handſome young man, called Bellerophon, mounted upon Pegaſus, who with a ſpear kills a chimera, which allegorically ſignifies a certain multiform variety of vices. The etymology of his name denotes a killer of vice.

FORE-SHORTENING, in drawing, ſignifies the drawing a thing as it appears to the eye, and not every part to its full length and proportion; but to make thoſe parts ſhorter whoſe full length and bigneſs are hid from our ſight.

As, if you would draw an horſe, ſtanding fore-right, looking as it were full in your face, you muſt of neceſſity fore-ſhorten his hinder parts, becauſe his ſides and flanks do not appear to you in their full latitude.

In like manner, if you were to draw a ſhip ſituated fore-right, there can appear to you only her fore-part, the reſt being hid from your ſight, and therefore muſt not be expreſſed.

Wherefore you muſt obſerve this rule always, rather to obſerve the viſible proportion of things, than their proper and natural proportion by meaſure; for the eye and underſtanding together, being directed by the art of proſpective, ought to be the guide and meaſure to judge of drawing and painting.

Obſerve therefore, in all Fore-ſhortenings, that there muſt be a proportion obſerved, according to the judgment of the eye, that what limbs appear may agree in proportion, as well as Fore-ſhortening.

Nothing muſt be expreſſed in drawing, but what is agreeable to nature in every point; as, if you were to draw a man turning his head over his ſhoulder, you muſt not make him turn or wind more than nature will permit; nor muſt any other action be forced beyond the bounds of nature, neither may it come ſhort of it.

So if you were to expreſs a man in any violent action, as fighting, either ſtriking or endeavouring to avoid the ſtroke; or as in running, wreſtling, leaping, or any other violent action; you muſt not expreſs any of theſe in a poſture that cannot agree

with the motion of nature, and that a man cannot imitate with his body, and the like as to all things elſe; for nature muſt be the parent and pattern of all kinds of draughts.

Of drawing a FORERIGHT *naked figure.* To draw a good naked figure very well is one of the moſt difficult performances in painting, becauſe it cannot be done well without underſtanding anatomy.

In doing this, firſt ſtrike a line perpendicular as long as you deſign the figure, and then divide that line into ſo many diviſions or parts as you deſign the proportion; the common or ordinary proportion is eight meaſures or heads, whereof the head is reckoned one of the eight.

Always begin with the head firſt, becauſe the body is always proportioned to the head; then divide the heads into four equal parts, the firſt for the hair, the ſecond for the forehead, the third for the noſe, and the fourth for the mouth and chin.

But a painter is not bound exactly to this rule, when he draws after the life; becauſe theſe rules were intended for no other uſe than to create the idea of ſuch and ſuch proportions firſt in our brain, and to prevent drawing in an extravagant and prepoſterous proportion: For faces differ one from another, ſome having long noſes, others ſhort; ſome an high forehead, others a low one; the diſtance betwixt the noſe and chin is longer in ſome than in others.

Then having ſketched out the line and framed the head, proceed downwards, and one head's length from the chin you draw the breaſts; the third reacheth to the navel, the fourth to the privities, the fifth to the middle of the thigh, the ſixth to the lower part of the knee, the ſeventh to the ſmall of the leg, and the eighth to the ſole of the foot. See plate XXIX.

Obſerve to draw the ſhoulders at the extremities or broadeſt part to be two heads and an half broad, the breadth of the hips to be but the diſtance of two heads, the arm to be ſix meaſures of the head long; but, if you reckon the breaſts in, they make eight, when the arms are extended out.

Alſo take notice, that, when the arm hangs down, it reaches within a ſpan of the knee.

In proceeding downwards, take care to place all the muſcles, in their right and proper places according to nature, as they are obſerved in the life; for there are no certain rules for the placing them.

Therefore it will be very advantageous to draw very much after the life, and after good prints of anatomy and ſtatues, and anatomies of plaiſter of Paris, which is the only way to arrive at the drawing a naked figure well.

FORTUNE, is repreſented, in painting, by a naked woman,

having an enſign or veil overſhadowing her, ſtanding upon a globe or ball.

Pauſanias ſays, that her moſt ancient form was that which Bupalus made in Greece, in ſhape of a woman, upon whoſe head was a round ball, and in one of her hands a cornucopia; ſhe is called the blind goddeſs and partial lady, by reaſon of the beſtowing of her unconſtant and mutable favours.

Macrobius ſays, ſhe was firſt repreſented, with wings on her ſhoulders, to ſhew that ſhe was always at hand among men, and had by her ſide the rudder of a ſhip, to ſhew, that ſhe rules and commands; ſhe herſelf being placed upon a wheel, holding in her right hand a golden ball, and in the other a whip, ſhewing where ſhe ſmiled wealth and honour; and where ſhe frowned croſſes and miſery ſhould follow.

In Egypt, ſhe was drawn, like a lady turning a great glaſs wheel, on whoſe top were many men playing; ſome climbing up, and others having attained it precipitating themſelves and falling down again.

Good FORTUNE, is repreſented, in painting, by a woman about to ſit down, leaning her right arm upon a wheel, inſtead of of the celeſtial globe; and holding a cornucopia in her left hand. —As the wheel is ſometimes up and ſometimes down, ſo fortune changes. The cornucopia denotes her being a diſpoſer of the riches and good things of this world; and the wheel, being continually in motion, ſhews fortune is fickle and ever and anon changes, ſometimes abaſing one and exalting another.

FOUNDERY, is the art of melting and caſting all ſorts of metals, particularly braſs, iron, &c.

The FOUNDERY of ſmall works, or the manner of caſting in ſand. The ſand uſed by founders in caſting of braſs, copper, &c. is of a yellowiſh colour, pretty ſoft and greaſy; but having been once uſed becomes black, by reaſon of the charcoal duſt uſed in the moulds.

Every time this ſand is uſed, it is wrought and tewed ſeveral times over in a board about a foot ſquare, placed over a kind of trunk or box, into which it may fall from off the board.

This tewing is performed with a roller or cylinder, about two feet in length, and two inches in diameter, and a ſort of knife made of the blade of a ſword; with theſe two inſtruments they alternatively roll and cut the ſand, and at length turn it down into the box underneath.

Then they take a wooden board or table of a length and breadth proportionable to the quantity of things to be caſt; round which they put a frame or ledge, and thus make a ſort of mould.

This mould is filled with the ſand before prepared, and a little moiſtened

When

When this has been done, they take models or patterns, either of wood or metal, of the things they would caſt; and theſe they apply on the mould, preſſing them down into the ſand, ſo as to leave their form indented.

Along the middle of the mould, is laid half a little cylinder of braſs, which is to be the maſter jet or canal for running the metal; being ſo diſpoſed as to touch the ledge at one ſide, and only to reach to the laſt pattern on the other.

From this are placed ſeveral leſſer jets or branches reaching to each pattern, whereby the metal is conveyed through the whole frame.

Having thus finiſhed the firſt frame, they turn it upſide down, to take out the patterns from the ſand, in order to which, they firſt looſen them a little all round, with a ſmall cutting inſtrument.

The counter-part, or other half of the mould, is done after the ſame manner, with the ſame patterns in a mould exactly like the former, excepting that it has pins, that entering the holes anſwer to them in the other caſe, that, when the two are joined together, the two cavities of the pattern fall exactly on each other.

The frame, having been thus moulded, is carried to the melter or founder; who, after enlarging the principal jet of the canal of the counter-part with a kind of a knife, and adding the croſs jets or canals to the ſeveral patterns to both, and ſprinkling them over with mill-duſt, ſets them to dry in a furnace.

When both parts of the mould are ſufficiently dried, they are both joined together by the means of pins; and to prevent their ſtarting or ſlipping aſide by the force of the metal, which is to be poured in flaming hot, through a hole contrived at the maſter jet, they are locked in a kind of preſs, either with ſcrews, or with wedges, if the mould be too big.

The moulds, having been thus ſet into the preſs, are ranged near the furnace, to be in readineſs to receive the metal, as it comes out of the crucible.

While they are thus preparing the moulds, the metal is put in fuſion in an earthen crucible, about ten inches high and four in diameter.

The furnace in which the metal is ſet for fuſion, is much like a ſmith's forge, having like that a chimney to carry off the ſmoke, a pair of bellows to blow up the fire, and a maſſive or hearth where the fire is made, which chiefly diſtinguiſhes the furnace from the forge.

In the middle of it is a ſquare cavity, ten or twelve inches wide, which goes to the very bottom. It is divided into two by an iron grate; the upper partition ſerves to hold the crucible and the fewel, and the lower to receive the aſhes.

The fewel is to be dry wood, which when it is well lighted, the crucible full of metal is ſet into the middle of it, and covered with an earthen cover; and a tile is laid over part of the aperture or cavity of the furnace, to increaſe the force of the fire, beſides blowing it up with the bellows.

When the metal is brought to a fluor, i. e. to be melted, they fill the crucible with pieces of braſs, beaten in a mortar, putting them in with a kind of iron ladle, having a long ſhank at the end, formed into a kind of hollow cylinder, out of which the ball is dropped.

The metal being all melted, the crucible is taken out of the fire by a pair of iron tongs, the feet of which are bent the better to embrace the top of the crucible, to the mould, into which he pours it, by the hole anſwering to the maſter jet of each mould.

And thus he goes on from one to another, till his crucible is emptied, or there is not matter enough left for another mould.

Then caſting cold water on the moulds, the frames are taken out of the preſſes, and the caſt works out of the ſand which is worked up again for another caſting.

Then they cut off the jets, and deliver the work to other perſons, who finiſh it.

The caſting of ſtatues, &c. The art of caſting ſtatues in braſs is very ancient; inſomuch that its origin was ſo remote and obſcure, that Pliny, an author admirably ſkilled in diſcovering the inventors of other arts, could not diſcover it.

All that we can learn for certain is, that it was practiſed in its perfection firſt among the Greeks, and afterwards among the Romans; and that the number of ſtatues, conſecrated to the Gods and heroes, ſurpaſſed all belief.

This taſte for ſtatues was carried to ſuch a pitch, that it became a proverb, that in Rome the people of braſs were more numerous than the Roman people.

Among us, the caſting of ſtatues was but little known or practiſed before the ſeventeenth century.

The method of caſting ſtatues or figures. There are three things chiefly required in caſting of ſtatues, buſts, baſſo-relievo's, vaſes, and other works of ſculpture.

The mould or core, ſo called of cœur the heart in French, as being the heart or middle of the ſtatue, is a rude, lumpiſh figure, a little reſembling the ſtatue deſigned to be caſt.

It is raiſed on an iron grate ſtrong enough to bear it, and is ſtrengthened on the inſide with ſeveral bars or ribs of iron.

It may be made indifferently of two ſorts of matter, as the work-man pleaſes, viz. potter's earth mixed up with horſe dung and hair; or of plaiſter of Paris mixed with fine brick duſt.

The uſe of theſe moulds in ſtatues is to leſſen their weight,

and

and ſave the expence of metal. In bells it takes up all the inſide, and it preſerves the vacant ſpace where the clapper is hung.

In great guns it forms the whole barrel from the mouth to the breech, and in mortars the barrel and chamber

The wax is a repreſentation of the ſtatue deſigned in wax.

If it be a piece of ſculpture, the wax muſt be all of the ſculptor's own hand, who uſually faſhions it on the mould itſelf.

It may be wrought apart in cavities moulded or formed on a model, and afterwards diſpoſed and arranged on the ribs of iron over the grate as before; filling the vacant ſpace in the middle with liquid plaiſter and brick-duſt; by which means the mould or core is formed in proportion as the ſculptor carries on the wax.

When the wax, which is to be the intended thickneſs of the metal, is finiſhed, there are little waxen tubes fitted perpendicularly to it, from top to bottom, to ſerve both as jets for the conveyance of the metal to all parts of the work, and as vent-holes to give paſſage to the air, which would otherwiſe occaſion great diſorder, when the hot metal came to encompaſs it.

The weight of the metal, that the figure will take up, is adjuſted by the weight of the wax; ten pounds of metal being allowed to one pound of wax.

The work now wants nothing but its ſhell, with which it is to be covered, and this is a kind of cruſt or coat laid over the wax, and which, being of a ſoft matter and even at firſt liquid, eaſily takes and preſerves the impreſſion of every part of it, which it afterwards communicates to the metal, upon its taking the place of the wax between the ſhell and the mould.

The matter of this outward ſhell or cover is varied, according as the different lays or ſtrata are applied.

The firſt is a compoſition of putty and old crucibles, well ground and ſifted, and worked up with water, to the conſiſtence of a colour fit for painting.

Accordingly it is applied with a pencil, laying it ſeven or eight times over; letting it dry betwixt whiles.

For the ſecond coating they lay horſes dung, and natural earth to the former compoſition, and the third impreſſion is only horſes dung and earth.

Laſtly, the ſhell is finiſhed by laying on ſeveral more coats or impreſſions of this laſt matter, rendered very thick with the hand.

The ſhell, being thus finiſhed, is ſtrengthened and ſecured by ſeveral bands or girts of iron wound round it at half a foot diſtance from each other, and faſtened at the bottom to the grate under the ſtatue, and at top to a circle of iron where they all terminate.

Here

Here it is to be obſerved, that if the ſtatue be too big, that it will not be eaſy to move the mould when thus provided, it muſt be wrought upon the ſpot where it is to be caſt.

This may be performed two ways; the firſt is by digging a ſquare hole in the ground, much larger than the mould that is to be made in it; and the walls of it muſt be lined with free-ſtone or brick.

At the bottom muſt be a hole of the ſame materials, with a kind of furnace, whoſe aperture muſt be outward.

In this a fire muſt be lighted to dry the mould and afterwards to melt the wax.

Over this furnace is placed the grate, and on this the mould, &c. frame as is above ſhewn.

In the laſt place, at one of the edges of the ſquare pit another large furnace is to be made for melting the metal, as hereafter mentioned.

In the other method, it is ſufficient to work the mould above ground; but with the ſame precaution of a furnace, and a grate underneath.

When this has been finiſhed, four walls are to be run up, and by the ſide thereof a maſſive made for a melting furnace.

As for the reſt, the method is the ſame in both.

The mould being finiſhed and incloſed between four walls, whether under ground or above it; a moderate fire muſt be lighted under it, and the hole covered with planks, that the wax may melt gently down, and run out at pipes contrived for that purpoſe at the foot of the mould, which are afterwards to be very exactly cloſed with earth, as ſoon as all the wax is carried off.

When this is done, the hole is filled up with bricks thrown in at random, and the fire in the furnace augmented, till ſuch time as both the bricks and the mould become red-hot; which uſually happens in twenty-four hours time.

Then the fire being extinguiſhed, and every thing cold again, the bricks are taken out, and their place is filled with earth moiſtened and a little beaten to the top of the mould, in order to render it the more firm and ſteady.

Matters being carried on thus far, nothing now remains to be done, but to melt the metal and run it into the mould.

This is done by the furnace above, which is made in the manner of an oven, with three openings; one to put in the wood, another for a vent, and a third for the metal to run out at.

In this laſt aperture or opening, which is kept very cloſe, all the while the metal is melting, a little tube or canal is laid, by which the melted metal is conveyed into a large earthen baſon over the mould, into the bottom of which all the big branches

of

of the jets, which are to carry the metal into all the parts of the mould, are inſerted.

Theſe jets are all terminated or ſtopped with a kind of plugs, which are kept cloſe, that, upon the opening of the furnace, the braſs which guſhes out like a torrent of fire, may not enter any of them, till the baſon be full enough of matter to enter them all at once.

Upon which occaſion they pull out the plugs, which are long iron rods with a head at one end, capable of filling the whole diameter of each tube.

The hole of the furnace is opened with a long piece of iron fitted at the end of each pole; and the mould filled in an inſtant.

The work being now finiſhed, at leaſt ſo much as belongs to the caſting; what remains is the buſineſs of the ſculptor or carver, who, taking the figure out of the mould and earth with which it is encompaſſed, ſaws off the jets with which it appears covered over, and repairs it with inſtruments proper to his art, as chiſſels, gravers, puncheons, and the like.

F. P. ſignifies Francis Primaticcio or Franciſco Parmegiano, who ſometimes put an F only in his wooden cuts, engraven with three tools.

F. P. I. V. Bonaſius. Theſe letters are found in a Madonna of Franceſco Primaticcio, engraved by Julio Romano.

Baptiſta FRANCE, a Venetian, ſcholar of Michael Angelo, lived at Rome, Florence, and Venice; excelled in hiſtory-painting, died in the year 1561.

FRAUD, is repreſented, in painting, by a woman with two faces, one young and the other old; feet like eagle's talons, a tail like a ſcorpion; two hearts in her right hand, and a maſk in her left.—The two faces denote Fraud and deceit, ever pretending well; the two hearts, the two appearances; the maſk intimates that Fraud makes things appear otherwiſe than they are, and the baſe deſigns and diſcord they foment, like birds of prey, to rob men of their goods and honour

John FREEMAN was a good hiſtory-painter in the reign of king Charles II; he was thought to have been poiſoned in the Weſt-Indies, but he returned to England, and died here; yet his genius was ſo much impaired by that attempt on his life, that his latter works failed of their uſual perfection; he was looked upon as a rival to Mr. Fuller, inſomuch that his brother colonel Freeman offered to lay a wager of 100 l. that he would draw a figure with that maſter; which challenge, but for what reaſon I know not, was never accepted.—Mr. Freeman was in his drawings, eſpecially in the academy, moſt extraordinary, and equal to any of our modern maſters. He was in his latter days ſcene-painter

to

to the playhouſe in Covent garden, where many of his works are ſtill to be ſeen.

FREE-WILL, is repreſented, by a man of juvenile years, cloathed in a royal habit of divers colours, crowned, and a ſcepter in his hand, on the top of which is the Greek letter ϒ.—He is young, becauſe diſcretion is requiſite to attain. The habit, crown, and ſcepter determine his abſolure power; the divers colours, his not being determined, and that he can act by divers means. The letter ϒ declares the two ways of man's life, virtue and vice as the ϒ is divided at the top.



Agnes FREJI, wife of Albert Durer, uſed this mark on ſeveral little plates, engraved by her, repreſenting our Saviour's myſteries, or elſe ſome ſcholar of his.

FRESCO, a method of painting or rather plaiſtering on walls to endure the weather, and repreſenting birds, beaſts, herbs, fruits, &c. in relief.

It is performed on freſh plaiſter, or on a wall laid with mortar, not yet dry, and with water colours.—The method of painting in Freſco is as follows:

The plaiſter muſt be made of well waſhed lime, mixed with fine powder of old rubbiſh ſtones; the lime muſt be ſo often waſhed, till all its ſalt is abſtracted, and all the work muſt be done in clear dry weather; or it may be mixed well with flints thoroughly burnt. And, in order to render the plaiſter more durable, they ſtrike, into the joints of the brick or ſtone wall, ſtumps of horſe nails at about ſix inches diſtance from each other, to prevent the plaiſter from peeling off. With this plaiſter the wall is firſt to be plaiſtered a good thickneſs, and left ſome time to dry; the deſign and colours being firſt ready prepared.

This painting is chiefly performed on walls and vaults, newly plaiſtered with lime and ſand; but plaiſter muſt only be laid in proportion as the painting goes on, no more being to be done at once than the painter can diſpatch in a day, while it is moiſt.

Before the painting is begun, there is uſually a cartoon or deſign made of paper, to be calked and transferred to the wall, about half an hour after the plaiſter has been laid on.

The colour being prepared and mingled, the wall is to be plaiſtered over again the ſecond time about the thickneſs of a half-crown; but only ſo much as you intend preſently to work upon, and while it is wet, you muſt work the colours therein, which will mix and incorporate with the plaiſter, ſo as never to waſh out.

The painting muſt be, for the work to come out in all its beauty, wrought quick, and with a free hand; for there can be no mending or alteration after the firſt painting, and therefore make

your

your colour high enough at firſt; yet you may deepen, but not eaſily lighten. Nor muſt they ever be retouched dry, with colours mixed up with the white of an egg, ſize, or gum, as ſome workmen do, by reaſon that ſuch colours grow blackiſh; nor do any preſerve themſelves, but ſuch as were laid on haſtily at firſt.

In this painting all the compound and artificial colours, and almoſt all the minerals are ſet aſide, and ſcarce any thing uſed but earths; which are capable of preſerving their colour, defending it from the burning of the lime, and reſiſting its ſalt, which Vitruvius calls its bitterneſs.

The colours uſed are white made of lime ſlaked long ago, and white marble duſt, oker both red and yellow, violet, red verditer, lapis lazuli, black, Spaniſh brown, Spaniſh white, &c. all which are only ground, and worked up with lime water, milk, or whey; and moſt of them grow brighter and brighter as the Freſco dries.

The bruſhes and pencils for this work muſt be long and ſoft, or elſe they will rake and raſe the painting.

The colours muſt be full and flowing from the bruſh; the deſign perfect in the image or paper copy, for in this work you cannot alter or add upon any colour.

This ſort of painting has a great advantage, by its incorporating with the mortar, and drying along with it; it is rendered extremely durable, and never fails nor falls, but along with it. The ancients painted on ſtuck, and it is worthy obſervation in Vitruvius, what infinite care they took in making the incruſtation or plaiſtering of their buildings, to render them durable and beautiful.

Before the painter begins his work, he prepares all the chief tints, and puts them into ſeparate earthen pots.

The painters generally try their colours on a dry ſmooth tile; for, the tile preſently imbibing all that is moiſt in them, and drying them, they ſee by it, what effect they will have when uſed.

Charles Alphonſe de FRESNOY, born in the year 1611; ſcholar of Perrier and Vouet; lived at Rome; excelled in hiſtory; died in the year 1665, aged fifty-four.

FRIGHT, is repreſented, in painting, by a man with a frightful aſpect, in armour, with a drawn ſword in his right hand, in a threatening poſture; in his left he holds Meduſa's head. His aſpect and arms inſpire fear, and his threats terrify; Meduſa's head denotes fears.

FRIT, } is the matter or ingredient, whereof glaſs is to
FRITT, } be made, calcined or baked in a furnace. See GLASS.

Neri obſerves, that Frit is only the calx of the materials that make

make glaſs; which though they might be melted, and glaſs made without thus calcining them; yet it would take up much more time.

This calcining or making of Frit ſerves for mixing and incorporating the metals together, and evaporating all the ſuperfluous humidity.

There are three kinds of Frits; the firſt is cryſtal Frit, or that for cryſtal metal, made with ſalt of polverine and ſand.

The ſecond and ordinary Frit is made of the bare aſhes of polverine or barillia, without extracting the ſalt from them. This makes the ordinary white or cryſtal metal.

The third is Frit for green glaſſes, made of common aſhes, without any preparation. This laſt Frit will require ten or twelve hours baking.

The materials uſed in each are to be reduced into a fine powder, waſhed and ſearced; then equally mixed, and frequently ſtirred together in the melting pot. See GLASS.

The way to make FRIT *for cryſtal.* The Venetians, who make glaſs in the iſle of Muran, as well as thoſe in Italy, make uſe of a white flint, which they have out of the river Ticinus; where there is abundance of them, as alſo in the river Arnus, both above and below Florence, and in other places.

They uſe alſo a rich ſand full of ſalt, which they find in Tuſcany, and in the vale of Arnus; as alſo a ſort of hard white marble, which is found in Tuſcany, known to every body; it grows at the foot of the little mountains Piſa or Sarvavezza, Maſſa or Carrara; that ought to be choſen, which is very white, which has no black veins, nor yellow or red ſtains in it.

Of all of theſe materials may be made very white tarſo, and alſo very fine glaſs and cryſtal.

It is certain, that all white and tranſparent ſtones, ſuch as will not become lime, are very fit for making glaſs; that all fire-ſtones, and thoſe which ſtrike fire, when they are calcined and reduced to an impalpable powder, and ſifted through a very fine ſieve, make an incomparable pure and fine cryſtal; and all the art conſiſts in reducing the tarſo to ſuch fine impalpable powder, but the great trouble in doing it has made the glaſs-men give it over.

They make uſe now-a-days much more of ſand than of flints, becauſe there is little or no expence in its preparation, which only conſiſts in waſhing it clean, and afterwards drying it, and ſifting it before you uſe it, and that is all; this is the firſt matter or ingredient for making glaſs; but, flints being found better and more fine, they afterwards made uſe of them; nothing but the parſimony and covetouſneſs of the times had brought the other

other in uſe again; becauſe glaſſes made of that may be afforded cheaper.

Cryſtal requires a ſoft and white ſand, common glaſs one more rough, hard and grating like a file; ſands differ very much from one another; for ſome will melt quickly, and mixing with the ſalt immediately be converted into glaſs; others again will endure a ſtrong fire, but in general there is no ſand, but what may be made into glaſs.

To make Frit, you muſt have two hundred pounds of tarſo, prepared as we have ſhewn; or fine ſand, and mix therewith about one hundred and thirty pounds of ſalt, alſo prepared after the manner elſewhere mentioned. See TARSO.

Care muſt be taken to mix the two materials well together; then put them into the furnace to be calcined, after it has been well heated to make the Frit.

During the firſt hour, the fire muſt be moderate, and the Frit continually ſtirred with an iron rake, that the materials may the better incorporate; then the fire muſt be increaſed to a very ſtrong heat for the ſpace of five hours, continuing always ſtirring the Frit with the rake, which is very neceſſary to the preparation of it.

After the ſpace of five hours, the Frit, having had ſufficient fire, will be made and reduced to lumps about the bigneſs of a filbert, which, if it be enough, in breaking will be light and white without any yellow; for, if you find any of that, you muſt put it into the furnace again, till it loſe that yellow colour which it will infallibly do.

By how much the more the materials are ſtirred and calcined in the furnace, they will be ſo much the more refined, and melt more eaſily in the pots; after this you take it out of the furnace, and let it cool; then you lay it on boards in a dry place, otherwiſe the moiſture would cauſe the ſalt to melt into water, and only the tarſo would remain behind, which of itſelf would never be made into glaſs.

After this you cover it well for fear of duſt, for you muſt take a great deal of care and caution to have a fine cryſtal.

The Frit, thus made, ought to be as white as ſnow; but, during the time it is making, you muſt try whether the quantities are well proportioned or not, which muſt be done by putting ſome of the Frit into a crucible, and afterwards on a clean piece of glaſs; where it may be ſeen whether it be well made by its joining together, and being clear; if it be too hard or too ſoft, you muſt increaſe or diminiſh the quantity of ſalt in it; which thoſe experienced in the art, know very well how to do at firſt ſight; this being well prepared, and kept in a dry place, will laſt three

three or four months; nay, it will grow better and more fit to unite together ſpeedily.

The way of making ordinary FRIT *of polverine rochetta, or barillia of Spain.* Frit made of polverine makes ordinary white glaſs, and that which is made of rochetta of the Levant, makes a very fair cryſtal; and that which is made of barillia of Spain, makes a glaſs not ſo white and fair, being commonly ſomewhat unctuous, which makes the glaſs incline to an azure or bluiſh colour.

To one hundred pounds of barillia you may put eighty-five or ninety pounds of fine tarſo (ſee TARSO) and you muſt regulate that doſe according to the goodneſs and fatneſs of the barillia, which experience will teach you.

Then you muſt mix ſix or eight pounds of good ſand with the doſe, after having well waſhed, dried, and ſifted it; and of the whole you make a Frit, which will produce a very white and fair glaſs.

The Frit being calcined in the furnace, you muſt take it out hot, and throw upon it three or four pails of cold water; and then put it in a moiſt and cold place, after which you muſt from time to time ſprinkle it with a ſmall ley for the ſpace of three months, which will render it as hard as ſtone, ſo that you cannot break it without a hammer; this Frit will melt eaſily, and makes a very white glaſs almoſt like cryſtal, but eaſier to work.

The leys, which communicate to it their ſalt, work this effect, and augment the Frit; if the leys ſhould fall ſhort, or you have none, you may water it with common water, which, although it is not ſo ſtrong as the ley, yet it is uſeful.

To make this ſmall ley, you muſt uſe the earthy parts or fæces, which ſettle in your earthen pots; when you make ſtrong leys, as follows:

You muſt fill the ſame veſſels with common water a little heated, and let it ſtand therein, long enough to extract the ſalt that remains; afterwards you take out that water gently with an iron ladle, without troubling the fæces, and filtre it, to clariſy it, and afterwards let it ſtand ſome time to ſettle, and then keep it for the uſe aboveſaid.

Theſe leys will be ſtill pretty ſharp and full of ſalt, communicate it to the Frit in watering it, and by this means none will be loſt.

It is true in our modern times, wherein workmen rather ſeek to abbreviate than embelliſh their work, there are but very few that take the pains to water their Frit after this manner. Yet, as that Frit is the fineſt, and moſt eaſy to melt, we thought it worth while to propoſe it.

FRUITS,

FRUITS, *roots, &c. to colour.* Apples. Colour with a thin maſticote mixed with verdigreaſe; ſhade with brown oker, and give their bluſh tinct with a thin or deep lake, and heighten with with white.—If you would have them very high-coloured, mix your white with ſome maſticote; but this muſt be according to the condition of the Fruit, whether ripe or unripe, red, yellow, or green, &c.

White cabbage. Do over with very thin yellow, and in ſome places with very thin green, or yellowiſh green, ſweetening with very thin brown oker, mixed with ſap-green; heighten with pure white.

Red cabbage. Lay with purple; ſhade with lake, and heighten with purple mixed with white.

Cherries. With vermilion and ſome braſil; ſhade with lake; heighten with vermilion mixed with white.

Heart cherries. Colour in the middle with vermilion and lake mixed with white, the circumference remaining whitiſh, here and there ſweetening them with lake, and heightening with white, mixed with a little lake.

Cucumbers. Colour the ends with a thin yellow, the middle with green, ſweetening the one into the other; and ſhading with ſap-green, but the whole fruit with brown oker; lay the ſpecks to the life with red and black.

Red and blue grapes. Colour with purple, ſhaded with blue, and heightened with white.

White grapes. Colour with thin verdigreaſe, which is called Spaniſh green, mixed with maſticote; ſhadow with thin verdigreaſe, and heighten with maſticote mixed with white.

Yellow melons. Colour with yellow, ſhaded with brown oker, the veins with ſtronger brown oker, and then heightened with white.

Green melons. Work with indigo mixed with verdigreaſe and ſap-green, ſweetened the one into the other, and ſhaded with ſap-green, but the whole fruit with brown oker; lay the ſpecks with red and black to the life.

Mulberries. Colour with a very ſtrong braſil, and lay them over with black, ſo that between the ſtalks and berries they may look a little reddiſh, according to nature.

Peaches. Colour them with thin maſticote, ſhaded with brown oker; give them a bluſh with lake, and heighten them with white.

Pears. Lay over with maſticote, ſhaded with brown oker, and give them a bluſh caſt with a thin deep lake, and heighten with white.

Blue plums. Colour with purple ſhadowed with bice, and

about the ſtalks with a little green, well ſweetened; heighten with purple and white.

White plums. Do over with thin maſticote, ſhaded with brown oker, and give them a bluſh with lake, and heighten them with white.

Radiſhes. Work them over with white, ſhaded with lake and ſweetened, as it were behind, with purple, and ſometimes with green from the top downwards.—Lay the green leaves at the top with verdigreaſe mixed with ſap-green, ſhaded with ſap-green, and heightened with maſticote.

Strawberries. Lay them over with a white ground, and draw that over with vermilion, and lake very thin; ſhade it with fine lake, and heighten with maſticote mixed with minium; and then with white, only ſpeck them with lake, by one ſide of which put a ſmaller ſpeck of white.

Turnips. Lay them over with white, ſhaded with ſoot; the leaves as the radiſh leaves.

Walnuts with their green on. Colour with verdigreaſe mixed with ſap-green; ſhade with ſap-green and a little white.

Walnuts without their green. Do over with brown oker, ſhadow with ſoot.

FRUITFULNESS, is repreſented by a lady ſitting on a bed, and two little infants hanging about her neck.

F. T. F. ſignifies Flaminio Torre fecit, the mark of a painter and engraver.

F. V. F. } ſignifies Francis Vannes fecit. Francis Vil-
F. *Villam.* F. } lamena alſo uſed the ſame mark.

Iſaac FULLER, was an Engliſh hiſtory-painter of good note. He had a great genius for drawing and deſigning hiſtory. Many perfections in his works may be ſeen by his reſurrection at All-Souls college chapel at Oxford; to which that at Magdalen college, though performed by the ſame hand, cannot in the leaſt compare. There is alſo at Wadham college, in the ſame univerſity, a hiſtory-piece of his in colours admirably well performed. He may be reckoned among the firſt claſs of Engliſh painters; he ſtudied many years in France under Perrier, and underſtood the anatomical part of painting, perhaps equal to Michael Angelo; following it ſo cloſe that he was very apt to make the muſcelling too ſtrong and prominent. He died in London about eighty-ſix years ago.

The manner of building FURNACES *for making glaſs.* Agricola mentions three ſorts of Furnaces for making glaſs; the firſt he called fornax calcaria or calcar, which is that where the frit is made.

This Furnace is made in the faſhion of an oven, about ten feet high and ſeven broad; this Furnace has two vaults, the one

A, as

A, as in the plate XIX, fig. 1, is that wherein the fire is made, having a hole on the top, through which the flame paſſes into the upper vault marked B, where it is reverberated from the roof upon the ingredients that make the frit, which are laid on the area or floor of this oven or vault, in which they are kept continually ſtirred about by the workmen, till they are vitrified and fully prepared. There ought to be a very large mouth to this vault, that the frit may be eaſily ſtirred about by the workmen; whereas there ſhould be but a ſmall mouth to the under vault, as ſerving only to put in the wood for maintaining a continual fire, and taking out the aſhes.

The lumps which lie by the Furnace are the frit, which they break when they are too big, to make them fit to go into pots for the great Furnace, there to be purified, and rendered fit to be employed as occaſion ſhall require.

The ſecond Furnace, or rather oven, which Agricola ſpeaks of, is the working Furnace, that where the workmen work; but the deſcription he gives of it is not in the beſt form, for he makes all theſe ovens round, whereas, though they are to be round within, they ſhould be oval without.

And beſides he gives two mouths in form of chimneys, into which a ſervitor throws coals day and night, which is not now in uſe, ſince there is only dry wood in uſe, and then the iron grates which he ſpeaks of for the mouth and aſh-hole are of no uſe among us.

The diameter of this oven ought to be always proportional to the height, the oven being divided into three parts, each of which three parts is vaulted.

That below marked F, fig. 2, is that where the ſtoker flings in the wood to keep a continual fire, and without ſmoke; and this lower oven is called the crown, and the mouth the bocca; but it has in it neither grates nor aſh-hole, the wood being caſt in on the coals, always taking care to take ſome of them out, when they are too many, with a large iron hollow ſhovel.

This oven made like a crown, to which Agricola allows but one hole in the middle of its height, about one foot diameter, has notwithſtanding ſeveral holes all round it, for the vent of the flame, which aſcends into the ſecond oven through the middle, where the pots filled with the ingredients for making the glaſs are placed at E, upon which that flame perpetually reverberates.

The ſecond part of this oven marked B, the vault of which is round, ſerves the workmen.

Agricola allots to each of theſe ovens eight arches; nevertheleſs we ſeldom, if ever, make more than ſix. Between each arch there is an opening or hole, made in the faſhion of a win-

dow archwiſe, marked C, called the great work hole, through which the pots, which contain the metal, are put in and taken out.

Theſe large holes are ſtopped each with a cover, made of the ſame lute and brick that the oven is, to preſerve the workmen's eyes from the too vehement heat, and likewiſe to keep that the ſtronger in the oven.

In the middle of every one of theſe covers, there is a hole ſomething more than a palm wide, which is called the little working hole, through which the workmen take with their hollow irons the coloured or finer metals out of the pots, with which they make bottles, drinking glaſſes, or what ſort of veſſels they pleaſe.

It alſo ſerves for ſcalding their veſſels, when they have occaſion, and which reſt upon hooks, made on purpoſe on the ſides of thoſe holes, which the workmen call the little working holes.

The place where they put the pots in the oven, is called the floor or ground; there are always two to each working hole in the little glaſs-houſes; the diſtinction between which and the great ones will be made anon.

The one, which is the leſſer, is full of fine metal, fit to work; and the other, which is the greater, is filled with metal that is to be purified or made fine. When the little pot is empty, is is immediately filled again with melted matter with an iron ladle, from the greater pots, when it has been refined; and, when the great pot is empty, it is filled again with new matter to be melted and refined, which is done alternately, that the workmen may not ſtand ſtill.

The upper vault of this Furnace marked D, fig. 2, which is above that where the metal is melted, and the workmen work, ſerves to ſet the veſſels new made upon, there to cool by degrees, that place having only a moderate heat; otherwiſe, if the veſſels were too ſoon expoſed to the cold air, they would break. See the three figures on plate XIX, which repreſents the furnaces above deſcribed.

This upper vault may alſo be divided into two, the one half of it being ſufficient for cooling the veſſels, and the other may be made a balneum mariæ of divers degrees of heat, ſand furnaces, or of aſhes for purifications, digeſtions, diſtillations, and other uſes, and may ſerve for the preparations of the ingredients, wherewith the tinctures are made for glaſs and cryſtal, which you will find treated of under their proper articles.

The third Furnace, of which Agricola makes mention, he makes of a ſquare form, and which, he ſays, is for making green glaſs; this is now no more in uſe, ſince they are all round on the inſide.

Facing p. 356.

Plate XIX.

Fig. 1.

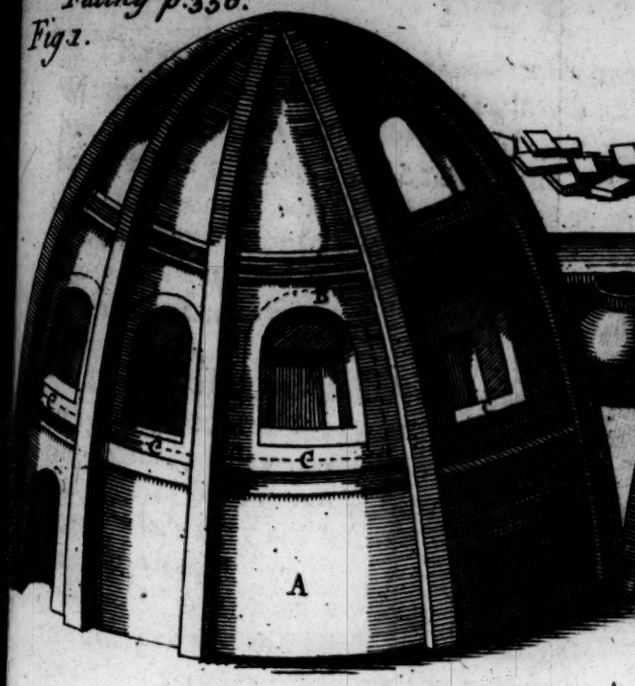


Fig. 2.

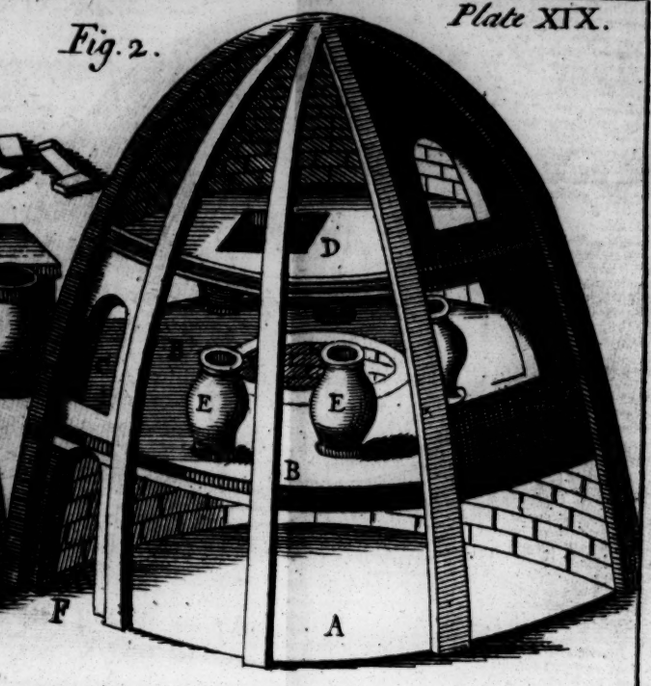
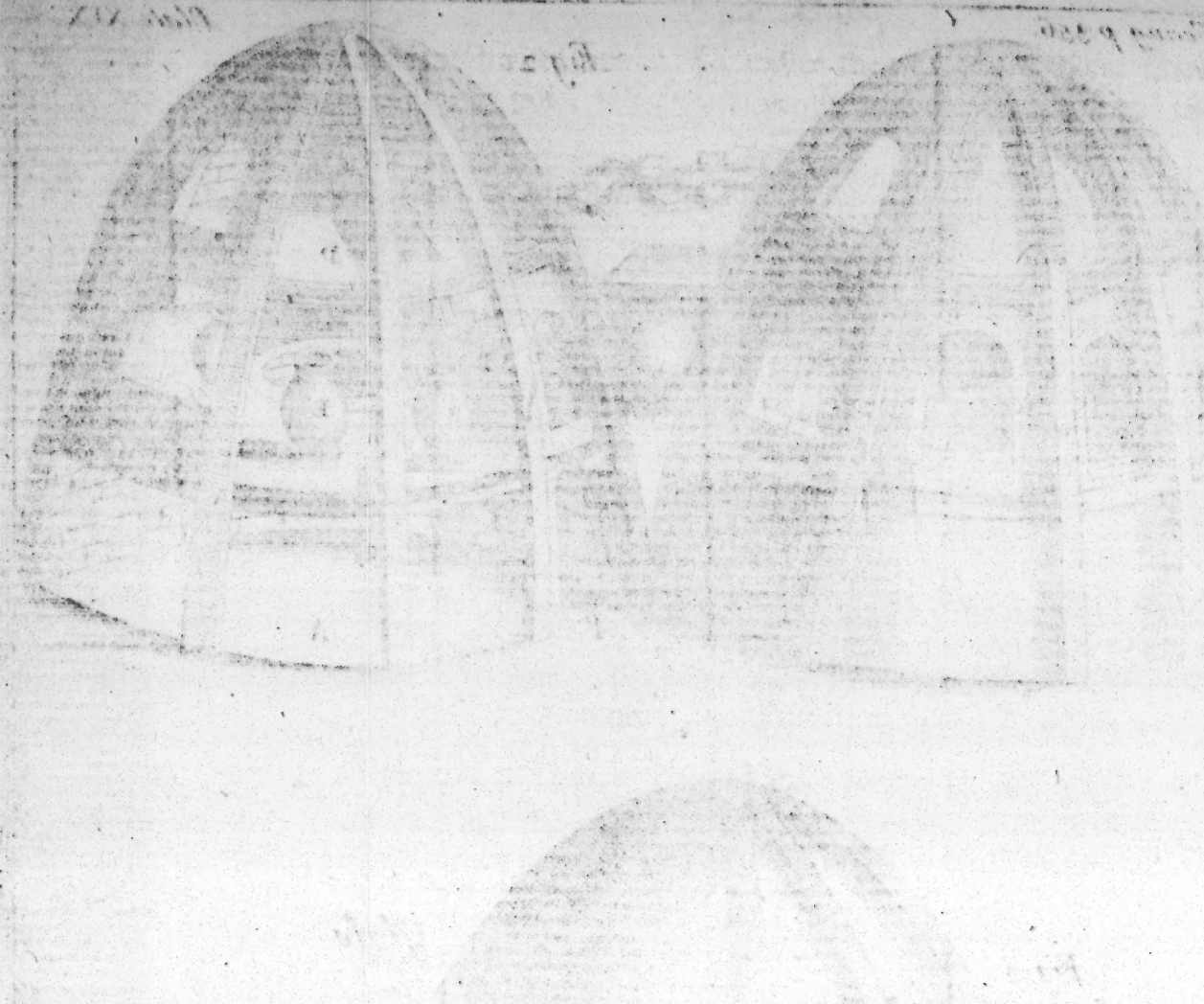


Fig. 3.





The ovens of the great glaſs-houſes are round within and oval without, like thoſe of the little glaſs-houſes, already treated of; but there is this difference, that any ingenious workman can build thoſe of little glaſs-houſes; but there is in France only one race of maſons, who have the ſecret of building the great ones. The difficulty conſiſts in this, that they muſt have three degrees more of heat than the little glaſs-houſes, and one inch difference in the arch and body of the oven is enough to ſpoil the whole proceſs.

Thoſe ovens are built like thoſe before-mentioned, except as to the proportions which augment the heat three degrees beyond the others; they have ſix arches, two of which ſerve to heat the matter before you put in the pots, and another to heat the pots before they are ſet into the oven, when there is occaſion to change them.

In this oven each working hole has but one pot in it, and, in the further end of the oven on the other ſide of the workmen, there is a great pot wherein the matter or ingredients is prepared, out of which it is taken with an iron ladle of ten or twelve feet long, to fill their pots, who work at the rates the pots are emptied; after that the great pot is filled again with other matter, to be refined and prepared as before.

The materials which ſerve for the building theſe Furnaces are bricks for the outward parts, and a ſort of fuller's earth for the inward parts, which is gotten in France from Beliere near Forges, and which is the only earth in all France, which has the property of not melting in this exceſſive heat; and it is of this ſame earth alſo that the pots are made, which will hold the metal for a long time.

The worſt and rougheſt work in this art is the changing the pots, when they are worn out or cracked; for then the cover of the great hole of the oven or working hole muſt be taken off, and the faulty pot ſo taken out, and a new one put in its place through the flames, and that very ſpeedily; the one is done with only hands, and the other is performed with iron hooks and forks.

But, before they ſet about this rough work, thoſe who do it cloath themſelves in a ſort of ſkins, in the ſhape of a pantaloon, which they make as wet as poſſible, and which covers them all over, except the eyes; and for them they make uſe of glaſs to ſee to guide themſelves.

And, indeed, without ſuch a ſort of cloathing it would be almoſt impoſſible to manage this change of the pots, by reaſon of the long time that it would otherwiſe take up, and which would be yet more incommoded by the vaſt and intenſe heat proceeding from the great mouth of the Furnace. See GLASS.

FULLING, is the art or act of cleanſing, beating, and preſſing cloths, ſtuffs, and ſtockings, to render them ſtronger, cloſer, and firmer, called alſo milling.

The Fulling of cloths and other ſtuffs is performed by a water mill, thence called a Fulling or ſcouring mill.

Theſe mills differ not much from corn mills, except in what relates to the mill-ſtones and hopper; and there are ſome which ſerve indifferently for either uſe, cloths being fulled and corn ground by the motion of the ſame wheel.

And in ſome places, and particularly in France, the fullers are called millers, as milling ſtuffs and grinding corn both at the ſame time.

The principal parts of the Fulling mill are the wheel, with its trundle, which gives a motion to the tree or ſpindle, whoſe teeth communicate it to the peſtles or ſtampers, which are hereby raiſed up and let fall alternately, according as its teeth catch on or quit a kind of latch in the middle of each peſtle.

The peſtles and troughs are made of wood, each trough having at leaſt two, and ſometimes three peſtles, as the owner ſhall think fit, or according to the force of the ſtream of water.

In theſe troughs are put the cloths, ſtuffs, &c. that are to be fulled; then, the current of water being let fall on the wheel, the peſtles are ſucceſſively raiſed and let fall upon the cloth, &c. in the troughs, and by their weight and velocity ſtamp and preſs the ſtuffs very ſtrongly, which, by this means, become thickened.

In Fulling they ſometimes make uſe of urine, ſometimes of fullers earth, and ſometimes ſoap.

Theſe ſtuffs are prepared to receive the firſt impreſſions of the peſtle by laying them in water and urine; then in fullers earth and water; and laſtly in ſoap diſſolved in hot water.

Soap alone would do very well, but that it is expenſive, tho' fullers earth, in the way of the Engliſh dreſſing, is ſcarce inferior to it; but then it muſt be well cleared of all ſtones and grittineſſes, which are apt to make holes in the ſtuff.

As to urine, that is accounted prejudicial, not ſo much upon account of its ſmell, but its ſharpneſs and ſaltneſs, which is apt to render the ſtuffs dry and harſh.

The true method of Fulling with ſoap is delivered by Monſ. Colinet, in an authentic memoir on that ſubject, ſupported by experiments made by order of the Marquis de Louvois, then ſuperintendent of the arts and manufactories of France. The ſubſtance of which is as follows:

A coloured cloth of about forty-five ells is to be laid in the uſual manner in the trough of a Fulling mill, without firſt ſoaking it in water, as is the common practice in many places.

Fifteen pounds of ſoap will be required to full this trough of

cloth, one half of which is to be melted in two pails of river or ſpring water made as hot as the hand can well bear it.

This ſolution is to be poured by little and little upon the cloth, in proportion as it is laid in the trough; and thus fulled for full two hours, and more; after which it is to be taken out and ſtretched.

Which being done, the cloth is to be immediately put again into the ſame trough without any new ſoap, and then fulled for two hours more; then it is to be taken out and wrung well, to expreſs or ſqueeſe out all the greaſe or filth.

After the ſecond Fulling the remainder of the ſoap is melted as the former, and caſt, at four different times, on the cloth, always remembering to take out the cloth to ſtretch it every two hours, and to get out the plaits and wrinkles it has acquired in the trough.

When it is perceived to be ſufficiently fulled, and brought to that quality and thickneſs it ſhould be, it is ſcoured out for good in hot water, keeping it in the trough till quite clean.

As to white cloths, becauſe they full more eaſily, and in leſs time than coloured ones, a third part of ſoap will ſerve.

FULLING *of ſtockings, caps, &c.* ſhould be performed ſomething differently, viz. either with the feet or the hands with a kind of rack or wooden machine, either armed with teeth of the ſame matter, or elſe horſes or bullocks teeth.

The ingredients uſed in Fulling; theſe are urine, green ſoap, white ſoap, and fullers earth; but the urine is looked upon as prejudicial.

Wove ſtockings ſhould be fulled with ſoap only; but knit ſtockings may have fullers earth uſed with the ſoap.

FURY, is repreſented, in painting, by a man ſhewing madneſs in his looks, his eyes tied with a fillet, in a poſture as if he had a mind to throw a bundle of arms bound up; in a ſhort habit. The fillet denotes the underſtanding loſt, when madneſs has dominion; for madneſs is the blindneſs of the mind. The arms ſignify that Fury is ever armed for revenge; the ſhort garment ſhews that he reſpects neither decency nor good manners,

FUSTIC, } is a yellow wood uſed in dying. The colour it
FUSTOC, } yields is a fine golden yellow; but there ought to be ſome other ingredients mixed with it to make it laſting.

The tree that produces it grows in all the Antilles iſlands, but particularly in Tabago, where it grows to a very great height.

It is uſed by dyers chiefly in dying blacks; but ſome ſay it ſhould not be uſed at all.

There is alſo another kind of Fuſtic or fuſtel growing in Italy, Provence, &c. uſed in dying a coffee colour.

G.

G. A. ſtands for the heirs of John Agucchia.

GALATEA, a ſea goddeſs, is deſcribed as drawn in a chariot of a ſtrange form, by two huge dolphins, guided by two ſilver reins, held in the hands of old Triton's daughters; over her head a canopy of purple ſilk and ſilver, with her hair hanging careleſly on her ſhoulders.

She is alſo deſcribed as a moſt beautiful young virgin, her hair diſhevelled and hanging careleſly about her ſhoulders, like ſilver threads; and at each ear a fair pearl, with a double ſtring of them, ſometimes, about her neck and left arm; a mantle of pure, thin, and fine white, waving as it were by the gentle breathing of the air, viewing in her hand a ſpunge made of ſea froth.

GANGES. This Indian river is repreſented, in painting, in the ſhape of a rude barbarous ſavage, with bended brows of a fierce and cruel countenance, crowned with a palm, having, as other rivers, his pitcher, and by his ſide a rhinoceros.

The plan of a GARDEN *in perſpective.* What has been already obſerved is confirmed by this plan, for, drawing lines from all the diviſions on the baſe-line to the point of ſight, the diagonal will give the depth of the whole plan, and the diminution of all the little ſquares. See DRAWING *in perſpective.*

Laſtly, ſetting off the alleys, figures, &c. from the correſpondent quantities in the geometrical plan, the whole parterre will be found in perſpective, as is ſhewn in the figure.

Let the plan, given you to diminiſh and put in perſpective, be of what ſort ſoever, the readieſt way will ſtill be to draw a ſquare about it, and divide that into ſeveral leſſer ſquares.

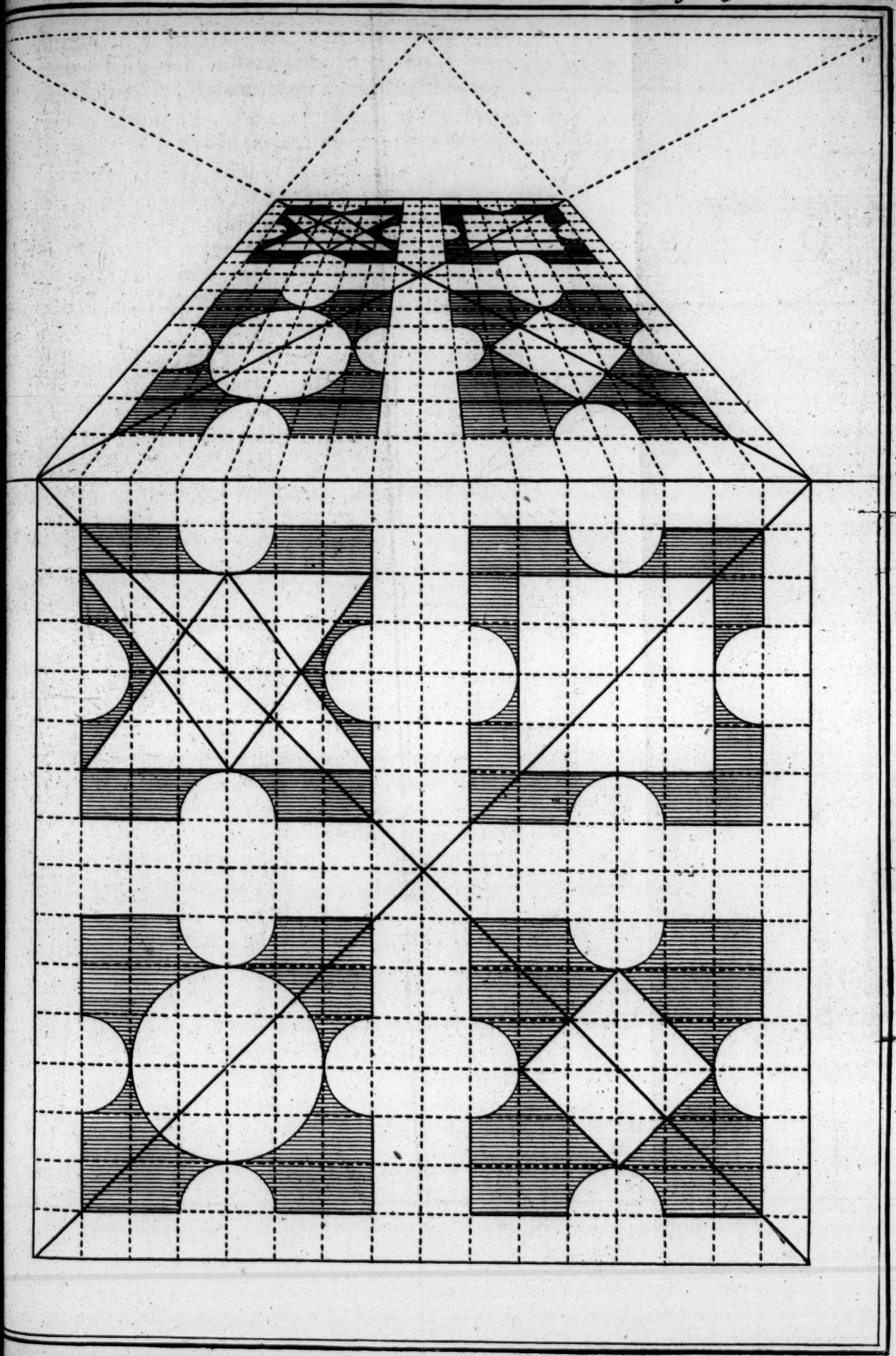
For putting the grand ſquare with all the leſſer ones in perſpective by the ordinary rules, you have nothing elſe to do but to take care that every thing take up the ſame number of little ſquares in the diminiſhed plan, as in the geometrical one, and the figure of the one will be found in the other. See plate XX.

GARMENTS. In drawing Garments, be ſure to draw the outlines very true, becauſe the whole grace of a picture conſiſts moſt in the outmoſt draught, more than in the curious work within. See DRAPERY.



Noel GARNIER, engraver of groteſques, ornaments, and figures, particularly of arts, in forty-eight pieces. He uſed this mark.

Mark GARRARD, ſon of Mark Garrard, and born at Bruges,



Bruges in Flanders. He was ſometimes principal painter to queen Eliſabeth, afterwards to queen Anne, royal conſort to king James I. He was both a good hiſtory and face painter; he died in London in the year 1635, in the ſeventy-fourth year of his age. There are ſeveral of his prints extant among us.

Henry GASCAR, a French face-painter, encouraged here by the Dutcheſs of Portſmouth, whoſe picture he came over to draw. Many, following her example, employed him alſo, ſo that he got a great deal of money in England in a ſhort time, nor could our wiſe nation ſee the difference between him and his cotemporary Sir Peter Lely. What the former wanted in the graceful port, in draught and a good choice of nature, the talent of but very few, he uſually made up with embroidery, fine cloaths, laced drapery, and a great variety of trumpery ornaments, which took for a while, till at length Monſieur found that his gay cap and feather would no longer ſucceed here, which made him leave England about eighty years ago; and, by a prevailing aſſurance cuſtomary with his nation, he has ſince impoſed as much on the Italian nobleſſe, as he did on thoſe of England; and was lately living in Rome, though we hear he is now dead. He is reported to have carried above ten thouſand pounds out of England.

GEMS. The deſign of this work is to make art imitate nature; which may, in this, be done to ſuch a degree, as that the artificial Gems may ſeem to ſurpaſs the natural oriental ones in beauty and colour, and want nothing of their perfection but the quality of hardneſs.

The baſis of artificial Gems is natural or rock cryſtal, which is a ſubſtratum made only of a congealed water and a pure ſubtile earth, as other precious ſtones are.

But precious ſtones differ from cryſtal in this, that they are tinged with a proper ſulphur or unctuous ſubſtance, which has inſinuated itſelf into the pores of their compoſition, which not only tinges them, but alſo fixes them, and gives them that admirable beauty and hardneſs which they poſſeſs.

This ſulphur is ſuppoſed to be an exhalation of metalline and mineral ſpirits, aſcending up by the force of a terrene central fire, containing a vaſt number and variety of colours undetermined, till brought into act and fixed in their proper ſubjects.

Now, the art of making theſe counterfeit Gems is the imitation of nature, by giving to a proper matter or body, ſuch as is that of rock cryſtal, ſuch metalline and mineral tinctures, as ſhall be extracted from metals or minerals, perfectly fine and ſubtile in themſelves, and able to reſiſt the fire; and theſe tinctures, though volatile, are fixed in cryſtal without altering their colour.

colour. See the method of making the ſeveral Gems under their proper articles.

GENEROSITY, is repreſented, in painting, by a virgin ſo amiable that ſhe attracts all eyes, cloathed in a mantle of gold gauze, leaning her left hand upon a lion's head, holding in her right, lifted up, chains of pearl and precious ſtones, as if ſhe meant to make a preſent of them.

Her youth denotes her extraordinary courage and Generoſity, which never degenerates; the naked arm, the property of this virtue to diveſt itſelf of all intereſts, and to be kind without hope of receiving any thing in exchange. The lion declares grandeur and courage.

GENIUS, is repreſented, in painting, by a naked child of a ſmiling countenance, with a garland of poppy on his head, ears of corn in one hand, and a bunch of grapes in the other.

Horatio GENTILESCHI, was an eminent Italian hiſtory-painter, born at Piſa, a city in the dukedom of Tuſcany, in the year 1578; after having made himſelf famous at Florence, Rome, Genoa, and in moſt parts of Italy, Savoy, and France, at laſt, he, upon the invitation of king Charles I, came over to England, and was well received by him, who appointed him lodgings in his court, gave him a conſiderable ſalary, and employed him in his palace at Greenwich and other places; his moſt remarkable performances in England were the cielings at Greenwich and York-houſe. He did alſo a Madonna, a Magdalen, and Lot and his two daughters for king Charles; all which he performed admirably well. The piece of his which was moſt eſteemed abroad, was the portico of cardinal Bentivoglio's palace at Rome; he made ſeveral attempts of face-painting while in England with little ſucceſs, his talent lying wholly towards hiſtory, with figures as large as the life, in which he excelled. He was much in favour with the duke of Buckingham, and many of the nobility of that time; but, after twelve years continuance in England, he died here in the year 1662, aged eighty-four, and lies buried in the queen dowager's chapel at Somerſet-houſe. His print is among the heads of Van Dyke, he having been drawn by that great maſter.

Artemiſia GENTILESCHI, was but little inferior to her father in hiſtories, and even excelled him in portraits, a manner of painting which moſt are inclined to attempt who come to England, where it is chiefly in vogue. She lived the greateſt part of her time at Naples in much ſplendor, and was as famous all over Europe for her amours as for her painting. She recommended herſelf to the eſteem of the ſkilful by many hiſtory-pieces as big as the life, amongſt which, the moſt celebrated was that of David, with the head of Goliah in his hand. She drew alſo

the

the portraits of ſome of the royal family, and many of the nobility of England.

GEOGRAPHY, is repreſented, in painting, &c. by an old dame in an earth-coloured garment, a terreſtrial globe at her foot, the compaſſes in her right hand, wherewith ſhe meaſures the ſaid globe, and a geometrical ſquare in her left.

Her old age denotes the antiquity of this art; the compaſſes, the meaſuring and deſcribing the earth, which is truly Geography; the ſquare, the taking ſeveral proportions, length, breadth, &c.

G. F. ſignifies Giorgio of Mantua fecit. In a piece of Primaticcio's, repreſenting Vulcan's forge.

GMF *or* MN These two marks were uſed by Giorgio Ghiſi of Mantua, he ſometimes put Ghiſi Mantouan fecit.

Richard GIBSON, commonly called the *Dwarf*, was a diſciple of Francis de Cleyn, and an eminent maſter in the time of Sir Peter Lely, to whoſe manner he devoted himſelf, and whoſe pictures he copied to admiration. Being page to a lady at Mortlake, ſhe put him to de Cleyn to learn to draw; which ſhe obſerved he had a particular genius to. He had the honour to inſtruct, in drawing, the late queen Mary, when princeſs of Orange, and queen Ann when princeſs; he went over to Holland to wait on the princeſs Mary for that purpoſe; he painted both in oil and water colours, but chiefly in the latter; he was greatly in favour with king Charles I, to whom he was page of the back-ſtairs, inſomuch that the King gave his wife in marriage, who was likewiſe a dwarf, and died about twenty years ago.

He received conſiderable favours from Philip, earl of Pembroke, who was his patron; he drew Oliver Cromwell ſeveral times, and died in Covent-garden ſoon after the revolution, at ſeventy-five years of age; he lies buried in that church.

William GIBSON, was nephew to the foregoing, and inſtructed both by him and Sir Peter Lely; his greateſt excellencies lay in his copies, after the laſt of thoſe two maſters, whoſe manner he made it his chief endeavour to imitate, and herein he was not altogether unſucceſsful; he became an eminent limner, and drew a great many portraits for many of the beſt rank. His great induſtry was much to be commended, for purchaſing, not only the greateſt part of Sir Peter's collection after his death, but likewiſe for procuring, beyond ſea, a great many valuable things in their kind, that he may well be ſaid to have had the beſt collection of drawings and prints, after the greateſt Italians and other maſters, of any perſon of his time; he was a great encourager of the art he profeſſed; he died lethargic in London, and

was

was buried at Richmond in Surrey, in the year 1702, at fifty-eight years of age. His kinſman Mr. Edward Gibſon was inſtructed by him, and firſt painted portraits in oil, but afterwards finding more encouragement in crayons, his genius lying that way, he made a conſiderable progreſs therein, till death intervening put a ſtop to all his endeavours. He died young at thirty-three years of age, and lies likewiſe buried at Richmond.

GILDING, is the art of ſpreading or covering a thing over with gold, either in leaf or liquid.

There are ſeveral methods of Gilding in uſe among us, as Gilding in water, Gilding in oil, Gilding by fire, &c.

The method of water GILDING. Water Gilding requires more preparation than oil Gilding, and is chiefly on wooden works, and thoſe made of ſtuc, and theſe too muſt be ſheltered from the weather.

A ſize is uſed for this way of Gilding, made of ſhreads, &c. of parchment, or gloves boiled in water, to the conſiſtence of a gelly.

If the thing to be gilt be of wood, it is firſt waſhed with this ſize, boiling hot, and then ſet to dry; and afterwards with white paint, mixed up with the ſame ſize.

Some uſe Spaniſh white for this purpoſe, and others plaiſter of Paris, well beaten and ſifted.

This ſized paint muſt be laid on with a ſtiff bruſh; which is to be repeated ſeldomer or oftener, according to the nature of the work, as ten or twelve times in flat or ſmooth works; but ſeven or eight will be ſufficient in pieces of ſculpture.

In the former caſe they are applied by drawing the bruſh over the work, in the latter by dabbing it.

When the whole is dry, they moiſten it with fair water, and rub it over with ſeveral pieces of coarſe linen, if it be on the flat; if not, they beat or ſwitch it with ſeveral ſlips of the ſame linen tied to a little ſtick, to make it follow and enter all the cavities and depreſſures thereof.

Having thus finiſhed the white, the next thing to be done is to colour it with yellow oker; but, if it be a piece of ſculpture in relievo, they firſt touch it up, and prepare the ſeveral parts which may have happened to have been disfigured by the ſmall iron inſtruments, as gouges, chiſſels, &c.

The oker uſed for this purpoſe muſt be well ground and ſifted, and mixed up with the ſize before-mentioned.

This colour is to be laid on hot; and, in works of ſculpture, ſupplies the place of gold; which, ſometimes, cannot be carried into all the depreſſures and cavities of the foliages and other ornaments.

A lay is alſo applied over this yellow, which ſerves for the ground

ground on which the gold is to be laid; this lay is uſually compoſed of Armenian bole, blood-ſtone, black lead, and a little fat; to which ſome add ſoap and oil of olives; others burnt bread, biſtre, antimony, glaſs of tin, butter, and ſugar-candy.

Theſe ingredients being all ground together with hot ſize, three lays of this compoſition are applied upon the yellow, the one after the other has been dried; being cautious not to put any into the cavity of the work to hide the yellow.

The bruſh uſed for this purpoſe muſt be a ſoft one, and, when the matter is become very dry, they go over it again with a ſtronger bruſh to rub it down, and take off the ſmall grains that ſtick out, in order to facilitate the burniſhing of the gold.

To be prepared for Gilding, you muſt have three ſorts of pencils; one to wet, another to touch up and amend, and a third to flatten; alſo a Gilding cuſhion for ſpreading the leaves of gold on when taken out of the book; ſee CUSHION; a knife to cut them, and a ſquirrel's tail fitted with a handle; or elſe a piece of fine ſoft ſtuff on a ſtick, to take them up directly and apply them.

You are firſt to begin with wetting your pencils; by which the laſt lay laid on with water is moiſtened, that it may the better receive and retain the gold. Then you are to lay the leaves of gold on the cuſhion, and, if whole, you muſt take up with the ſquirrel's tail; but, if in pieces, with the other inſtrument, or the knife wherewith they are cut, and lay and ſpread them gently on the parts of the work you had moiſtened before.

If the leaves, as they frequently do, happen to crack or break in laying on, theſe breaches muſt be made up with ſmall bits of leaf taken up upon the repairing pencil, and the whole work is to be ſmoothed either with the ſame pencil or another ſomething larger; the gold being preſſed into the dents, into which it could not be ſo eaſily carried by the ſquirrel's tail.

The work, having been thus far gilded, muſt be ſet by to dry, in order to be either burniſhed or flatted.

Burniſhing is ſmoothing and poliſhing it with a burniſhing tool, which is uſually a dog's or wolf's tooth, or a blood-ſtone fitted into a handle for that purpoſe. See BURNISHING.

Flatting it is giving it a light lick, in the places not burniſhed, with a pencil dipped in ſize, in which a little vermilion ſometimes has been mixed. This ſerves to preſerve and prevent its ſlawing when handled.

The laſt operation is the applying the vermeil in all the little lines and cavities, and to ſtop and amend any little faults with ſhell gold.

The compoſition called vermeil is made of gum guttæ, vermilion, and a little of ſome ruddy brown colour ground together, with

with Venetian varniſh and oil of turpentine. Some gilders, inſtead of this, make ſhift with fine lucca or dragons blood with gum water.

Sometimes, inſtead of burniſhing the gold, they burniſh the ground or compoſition laid on the laſt before it, and only afterwards waſh the part over with the ſize.

This method is chiefly practiſed for the hands, face, and other nudities in relievo; which, by this means, do not appear ſo very brilliant as the parts burniſhed, though much more ſo than the parts perfectly flat.

To gild a piece of work, and yet preſerve white grounds, they apply a lay of Spaniſh white mixed with a weak fiſh-glue on all the parts of the ground, whereon the yellow or the laſt lay might run.

The method of GILDING *in oil.* This operation requires much leſs apparatus than that before mentioned.

The baſis or matter whereon the gold is laid, in this method, is the remains of colours found ſettled to the bottom of the pots in which painters waſh their pencils.

This matter, which is very viſcid or ſticky, is firſt ground, and then paſſed through a linen cloth; and thus laid with a pencil on the matter to be gilded, after it has been waſhed once or twice over with ſize; and, if it be wood, with ſome white paint.

When this is almoſt dry, but yet is ſtill unctuous enough to catch and retain the gold, the leaf gold is laid on; either whole, if the work be large, or cut to pieces, if ſmaller; the leaves of gold are taken up and laid on with a piece of fine, ſoft, well carded cotton; or ſometimes by a pallet for the purpoſe, or ſometimes with the knife with which the leaves were cut, according to the parts of the work that are to be gilded, or the breadth of the gold that is to be laid on.

As the gold is laid on, they paſs over it a coarſe ſtiff pencil or bruſh to make it ſtick, and, as it were, incorporate with the ground; and, after this, they mend any cracks that may have happened in it, either with the ſame pencil or one that is ſmaller; as has been ſhewn before in water Gilding.

This kind of Gilding is chiefly uſed for domes and roofs of churches, courts, banqueting-houſes, &c. and for figures of plaiſter of Paris, lead, &c.

The method of GILDING *with liquid gold.* This is performed by gold reduced to a calx and amalgamated with mercury, in the proportion of about an ounce of mercury to a drachm of gold.

To perform this, they heat a crucible red-hot, and then put the gold and mercury into it, ſtirring them gently about till the gold be found melted, and incorporated into a maſs with the mercury.

When

When this is done, they caſt them into water to waſh and purify them; and out of that into other waters, where the amalgama which is almoſt as liquid, as if there were nothing but quickſilver in it, may be preſerved a long time for uſe.

Before they proceed to lay this amalgamated gold on the metal, they firſt render the metal rough, by waſhing it over with aqua-fortis or aqua ſecunda; and afterwards rinſe the metal in fair water, and ſcour it a little with fine ſand, and then it is ready for the gold.

Then they cover over the metal with the mixture of gold and mercury, taking it up with a ſlip of copper or a bruſh made of braſs wire, ſpreading it as even as poſſible, to do which they wet the bruſh from time to time in fair water.

Then they ſet the metal to the fire upon a grate or in a ſort of cage, under which ſtands a pan of coals; and, in proportion as the mercury evaporating and flying off diſcovers the places where gold is wanting, they take care to ſupply them by adding new parcels of amalgama.

Then the work is rubbed over with the wire bruſh dipped in beer or vinegar, which leaves it in a condition to be brought to a colour, which is the laſt part of the proceſs; and which the gilders keep to themſelves as a mighty ſecret; though it is certain, it cannot differ much from the manner of giving gold ſpecies their colour in coining.

To gild glaſs. Take chalk and red lead of each a like quantity, grind them together and temper with linſeed oil; lay it on, and, when it is almoſt dry, lay leaf gold on; let it dry, and then poliſh it.

To gild iron. Take one pound of liquid varniſh, linſeed oil, and turpentine, of each one ounce; mix them well together, ſtrike them over any metal, and afterwards lay on leaf gold or ſilver, and when it is dry poliſh it.

To gild ſilver, braſs, or copper with gold water. Take two ounces of quickſilver, put it into a crucible, ſet it on the fire, and, when it begins to ſmoak, put in an angel of fine gold; then take it off immediately, for the gold will be preſently diſſolved; then, if it be too thin, ſtrain a part of the quickſilver from it through a piece of fuſtian; when you have done this, rub the gold and quickſilver upon braſs or ſilver, and it will cleave to it; then put the ſaid braſs or ſilver upon quick coals, till it begins to ſmoak; then take it from the fire, and ſcratch it with a hair bruſh; this do till all the mercury is rubbed as clean off as may be, and the gold appears of a faint yellow; then heighten the colour with ſal armoniac, bole, and verdigreaſe ground together and tempered with water.

Where

Where you muſt take notice, that, before you gild your metal, you muſt boil it in tartar or beer and water.

Another water for GILDING *iron, ſteel, knives, ſwords, &c.* Take fire-ſtone, reduce it to powder, put it into a ſtrong red wine vinegar in a glazed pot for twenty-four hours, adding more vinegar to it as it evaporates or boils away; into this water dip the iron, ſteel, &c. and it will be black; dry it, and then poliſh it, and you will have a gold colour underneath.

Another way of GILDING *iron.* Take ſalt-petre, roch alum burnt, of each an ounce, ſal armoniac two ounces, all reduced to fine powder; boil them in ſtrong vinegar in a copper veſſel, with which wet the iron, &c. and then lay on leaf gold.

To gild on wood or ſtone. Take bole armoniac and oil of ben, of each a ſufficient quantity; beat and grind them together, and ſmear the wood or ſtone, and, when it is almoſt dry, lay on leaf gold, let it dry, and poliſh it.

To gild with leaf gold. Grind leaves of gold in a few drops of honey, and add to it a little gum water, and it will be excellent to write or paint with.

To gild ſilk and linen. Lay ſome parchment glue on the ſilk or linen gently, that it may not ſink; then mix and grind ceruſs and verdigreaſe together, of each a like quantity; mix them with varniſh in a glazed veſſel, let it ſimper over a ſmall fire, and keep it for uſe.

Another of a pure gold colour. Take the juice of freſh ſaffron, or ſaffron ground, the beſt clear orpiment, of each a like quantity; grind them with goats gall or gall of a pike, which is better; digeſt twenty-eight days in horſe-dung, and it is done.

To colour tin or copper of a gold colour. Set linſeed oil on the fire, ſcum it and put in amber, aloes, hepatic, of each a like quantity; ſtir them well together till it grows thick; then take it off, cover it cloſe, and ſet it in the earth for three days; and when you uſe it ſtrike the metal all over with it, let it dry, and it will be of a golden colour.

To ſilver any metal. Diſſolve fine ſilver in ſtrong aqua-fortis, and put in as much tartar finely powdered as will make it into a paſte; with which rub any metal, and it will look like fine ſilver.

To gild paper. Grind bole armoniac with rain water, and give one laying of it when it is dry; take glair of eggs, and add to it a little ſugar-candy and gum water, which lay over the former, and, upon this, when it is dry enough, lay leaf ſilver or leaf gold.

To gild the leaves of books. Take bole armoniac eight pennyweights, ſugar-candy two pennyweights, mix and grind them with glair of eggs; then, on a bound book, while it is in the preſs, after it hath been ſmeared with glair of eggs and is dried,

ſmear

ſmear the ſaid compoſition, let it dry, then rub it well and poliſh it; then, with fair water, wet the edges of the book, and ſuddenly lay on the gold, preſs it down gently with cotton, let it dry, and then poliſh it with a tooth.

The method of GILDING *ſilver, braſs, copper, or princes metal.*

1. The thing to be gilded muſt firſt be ſcrubbed with a wire bruſh and a little fair water, till it is perfectly clean.

2. Then, having put an ounce of quickſilver into a phial, drop into it three, four, or five drops of aqua-fortis; with this mixture and a rag rub over the metal to be gilded, till it is everywhere as white as ſilver.

3. Then, with a ſmall knife, ſpread your amalgamated gold over the whole piece, taking care not to miſs any part of it; then give it a heat over a fire to force the quickſilver to evaporate or fly away, and the gold will remain ſticking cloſe to the piece.

4. But, before you give it a thorough heat, let it have two or three little heats, that you may, with a ſmall hair bruſh, almoſt like that of a comb, dab and ſpread the gold, which you may the eaſier do, becauſe the warmth you give it makes the quickſilver the more ready to ſpread; after which give it the thorough heat before-mentioned.

5. Afterwards take it from the fire, and, with a hair ſcrub bruſh, which has never touched quickſilver, rub and cleanſe it as you did before. And you muſt take notice, if there be any ſpot left ungilded, you muſt, after you have cleanſed it with the wire bruſh, proceed again as before.

6. If you would have the work more rich and laſting, beſmear it again with quickſilver and aqua-fortis, and lay on the gold again, after the ſame manner as before; and this you may repeat ſo often till the gold lies as thick as your nail upon the metal you gild.

7. *To heighten the colour, if you think fit.* Take argal, ſalt, and ſulphur, of each what quantity you think convenient, and put to them as much fair water as will juſt cover the thing that you put into it to be gilded; boil them over the fire, and, having tied the gilded piece to a ſtring, put it into the boiling liquor for a little ſpace, viewing it every minute; and, when it has obtained a colour according to your mind, put it immediately into cold water, and it is done.

Another way to heighten the colour of gold. Take nitre, ſal armoniac, ſandever, verdigreaſe, white and green vitriol, of each a like quantity; grind them with white wine vinegar, which lay over all your work; then lay it on a fire, and give it a ſmall heat, that it may ſmoak, and ſo take it off and quench it in urine.

Another way to gild ſilver, braſs, &c. Firſt cleanſe the metal with aqua-fortis, then quicken your work with mercury, then

take off the gold amalgamated as before directed, and lay it on with a ſmall knife, ſpreading it every-where, and do in all things as before-directed.

To ſilver over braſs or copper plates, as clock-makers do their dial-plates. Procure either leaf or burnt ſilver, and put to it as much aqua-fortis as will cover it; let it ſtand an hour or two; then decant off the aqua-fortis as clean as may be, waſh the ſilver three or four times in fair water; and then let it dry, and mix with it, one part of fine argal to three parts of the ſilver, with a little fair water.

When you uſe this, rub it on the work with a cork, till it is ſilvered all over, and lies very fair, and afterwards dry it well with a linen cloth, and warm it; then waſh it over three or four times with the beſt white varniſh, which will preſerve it from tarniſhing, and other injuries of the weather.

To gild braſs, copper, iron, or ſteel, with leaf ſilver or gold. If you would gild braſs or old iron, firſt cleanſe it very well with a wire bruſh; but, if it is new iron or ſteel, firſt make it very ſmooth, and hatch it all over very neatly with a hatching knife, which is a knife with a ſhort blade and a long handle.

Then give it an heat on a charcoal fire, ſo as to make it look blue; take it from the fire and lay on the gold or ſilver, and burniſh it down a little with a blood-ſtone or burniſher; and then give it the ſame heat again and burniſh it all over.

This work of Gilding may be repeated ſix, eight, or ten times, ſtill obſerving to give it the ſame heat, before you lay on the gold and ſilver, and then burniſh it as before directed.

Claudio GILLE, of Lorrain, was born in the year 1600, ſcholar of Auguſtino Taſſo, lived at Rome, excelled in hiſtory, died in 1682, aged eighty-two.

The GILLIFLOWER. To paint there are many ſorts of Gilliflowers, as white, yellow, purple, ſtriped, ſtreaked, or variegated with ſeveral colours.

For white ones, cover with white and ſhade with black and a little indigo, for the heart of the leaves.

For the yellow ſort, uſe maſticote, gamboge, and gall-ſtone.

For the purple ſort, uſe purple and white, finiſh with leſs white, making them brighter in the heart, and alſo ſomewhat yellowiſh.

For the red ſort, uſe lake and white and finiſh without white.

For the ſtriped and variegated ſort, lay on white and variegate ſometimes with a purple, in which ultramarine predominates, or ſometimes with a purple in which carmine prevails or lake; ſometimes with white, and at other times without it, ſhading the reſt of the leaves with indigo.

The

The ſeed of them all is to be done with verditer and maſticote, finiſhed with iris.

The leaves and the ſtalks are to be done with the ſame green, mixed with iris to ſhade with.

To make GILLIFLOWERS *grow double of any ſeed.* Put the ſeed of a ſingle Gilliflower into a bean, that the ſprout or ſpire is taken from, ſo that the bean may not grow; ſtop the hole cloſe with ſoft wax, and ſet the bean into convenient fat mould, and the Gilliflower ſeed, as the bean rots, ſpringing up, will produce double flowers, large and beautiful.

To make pinks and GILLIFLOWERS *blue and purple.* Slit a ſuccory root, and place the root of your flower; then ſet it in a convenient bed, and cover it with light mould, and, the ſeed drawing a virtual nouriſhment from that root, when the pink, &c. grows up, it will produce a blue flower.

GIacinto GIMINIANI, of Piſtoja, ſcholar to Peter de Cortona, uſed this mark.

GIOTTO, born in the year 1276, diſciple of Cimabue, lived at Florence, excelled in hiſtory, ſculpture, and architecture; died in the year 1336, aged ſixty years.

GIO *Porto*, afterwards called *Gioſeppe Salviati*, born in the year 1526 or 1533, ſcholar of Franceſco Salviati, lived at Venice, excelled in hiſtory-painting, and died aged fifty years.

Luca GIORDANO, called *Lucaſa Preſto*, born in the year 1626, ſcholar of Spagnolet and Peter de Cortona, lived at Florence, Naples, and Madrid; excelled in hiſtory; died in the year 1694, aged ſixty-eight years.

GLADIOLA. To colour this flower, lay on columbine, lake, and white, very pale; then proceed and finiſh with lake only, very bright in ſome places and very deep in others, always adding biſtre to it for the ſtrongeſt ſhades; let the green be verditer, and ſhade with iris.

GLASS. A tranſparent, brittle, factitious body, produced of ſalt and ſand by the action of fire.

The materials uſed in the compoſition of Glaſs, as has been obſerved, are ſalt and ſand or ſtone. See FRIT.

The ſalt is of the fixed kind, ſuch as will not evaporate with the moſt intenſe heat; the ſand or ſtone muſt be ſuch as will melt eaſily; this is what gives firmneſs and conſiſtence to the Glaſs.

1. This ſalt is procured chiefly from a kind of aſhes called polverine or rochetta, brought from the Levant, and particularly from Alexandria and Tripoli.

The aſhes are made of a vegetable, growing in great abundance in the country, commonly called kali, and alſo ſoda and

ſaltwort, from its ſaline taſte; and alſo glaſs-weed, from the uſe made of its aſhes in making Glaſs.

To get the ſalt from this polverine, they pulveriſe and ſift it very fine; then boil it in a braſs copper, with fair water and tartar, till a third part of the water is conſumed, taking care to ſtir it from time to time.

Then, filling up the copper with freſh water, they boil it a ſecond time till half be conſumed; when this has been done, there remains a ley impregnated with ſalt. To get the leys from the ſalt, they boil them, till the ſalt ſhoots at the top, which they ſcum off as it riſes; an hundred pounds of aſhes this way uſually yield eighty or ninety of ſalt.

When the ſalt is dry, they beat it groſly, and put it into a furnace to dry it farther with a gentle heat. When it has been ſufficiently dried, they pound and ſift it very fine, and lay it by to make frit.

But you muſt alſo take notice, that, beſides the aſhes of kali, thoſe of fern will alſo yield a ſalt, which will make excellent Glaſs, in nothing inferior to that of polverine.

The method of preparing the aſhes of fern is the ſame as that of thoſe of kali.

The aſhes alſo of the cods and ſtalks of beans, as alſo of coleworts, bramble-buſh, millet-ſtalks, ruſhes, and many other plants, may be uſed for the ſame purpoſe.

2. As for ſtone, which is the ſecond ingredient in Glaſs, the beſt of which is that which will melt, is white and tranſparent. This ſort of ſtone is found chiefly in Italy and is called tarſo, and is a kind of marble; the next is quocoli or cuogele, a ſort of pebbles, found at the bottoms of rivers.

Indeed nothing makes finer and clearer Glaſs than flint; but the charge of preparing it deters Glaſs-makers from uſing it; the preparation neceſſary for ſtone is to calcine, powder, and ſearce it.

Anthony Neri obſerves, that all white tranſparent ſtones, which will not burn to lime, are fit to make Glaſs; and that all ſtones which will ſtrike fire with ſteel, are fit for making Glaſs. But Dr. Merret objects againſt this laſt rule as not holding univerſally.

Where Glaſs-makers cannot eaſily have proper ſtone, they make uſe of ſand, the beſt for the uſe is that which is white and fine; for green Glaſs, that which is harder and more gritty.

The preparation that it needs is only waſhing it well.

Maidſtone in Kent furniſhes our Glaſs-houſes with white ſand for their cryſtal Glaſs, and with the coarſer for green Glaſs.

The method of making white and cryſtal GLASS. There are three ſorts of furnaces uſed in making Glaſs; the one to prepare

the frit, called the calcar; a ſecond to work the Glaſs; and a third, called the leer, to anneal it. See the article FURNACE.

For the making cryſtal Glaſs, take of the whiteſt tarſo, pounded ſmall and ſearced as fine as flower, an hundred pounds, to ſixty-five pounds of polverine.

Mix them well together, and put them into the furnace, called calcar, firſt heating it: Keep a moderate fire for an hour, continually ſtirring the materials, that they may incorporate and calcine together.

Afterwards increaſe the fire for five hours; after which take out the matter, which, being now ſufficiently calcined, is called ſalt of frit, which is alſo called bollito.

Take the frit out of the calcar, lay it up in a dry place, keep it covered from the duſt, and let it lie for three or four months.

To make the Glaſs, take of this cryſtal frit; ſet it in pots into the furnace, adding to it a proper quantity of manganeſe; (ſee MANGANESE) when they are both fuſed or melted, caſt the fluor, i. e. the melted matter, into fair water, to purify it from the ſalt called ſandever, which, if not cleared from it, would make the cryſtal obſcure and cloudy.

This lotion or waſhing muſt be repeated ſeveral times, till the cryſtal is fully purged.

When this has been done, let it boil for four, five, or ſix days; then try whether it has had manganeſe enough; and, if it look ſtill greeniſh, add more manganeſe, by little and little at a time, with diſcretion; but be ſure to take care not to overdoſe it, becauſe the manganeſe inclines it to a blackiſh hue.

Then let the metal clarify, till it becomes of a clear and ſhining colour; which when it comes to, it is fit for blowing, or to be formed into veſſels at pleaſure.

There are three principal kinds of Glaſſes, diſtinguiſhed by the form or manner of working them, viz. 1. Round Glaſs, as theſe of our veſſels, phials, drinking Glaſſes, &c. 2. Table or window-Glaſs, of which there are various ſorts, viz. crown Glaſs, jealous Glaſs, &c. and plate Glaſs or looking Glaſs.

The method of working or blowing round GLASS. The working furnace being round has ſix bocca's or apertures; at one of which, called the great bocca, the furnace is heated, and the pots of frit ſet in the furnace; two other ſmaller holes, called boccella's, ſerving to lade or take out the melted metal, at the end of an iron to work the Glaſs: At the other holes are put in pots of other fuſible ingredients to be prepared, and at laſt emptied into the lading pot.

There are to be ſix pots in each furnace, all made of tobacco-pipe clay, proper to ſuſtain not only the heat of the fire, but

alſo the violent effects of the polverine, which penetrates every thing elſe.

But two of theſe pots are wrought at, the reſt ſerving to prepare the matter for them.

The fire of the furnace is made and kept up with dry hard wood, caſt in without intermiſſion at the ſix apertures: This is never omitted, even upon the moſt ſolemn days.

When the matter, contained in the two pots, is ſufficiently vitrified, then they are wrought, by taking out the metal, blowing, and faſhioning it.

The metal having been now ſufficiently refined, the operator or ſervitor takes his blowing iron, which is a hollow tube, about two feet and an half long, or longer, and, dipping it into the melting pot, there turns it about, and the metal ſticks to the iron, like ſome glutinous or clammy juice, much like, but more firmly than Venice treacle.

For each Glaſs he dips four times, and at each dip rolls the end of his inſtrument, with the Glaſs upon it, on a piece of iron, over which is a veſſel of water, the coolneſs whereof helps to conſolidate the Glaſs more readily, and diſpoſes it the better to bind with the next to be taken out of the pot; when the operator has dipped the fourth time, and there is now metal enough upon the blowing iron, he blows gently through the iron, by which he raiſes or lengthens it nearly a foot, after the manner as is done by blowing in a bladder or globe; and, to give it a poliſh, he rools it to and fro on a ſtone. See plate XIX, fig. 3. where A repreſents the blowing iron; B, the ſecond ſtory of the furnace; C, the bocca; and D, the upper ſtory of the furnace.

Then he blows again a ſecond time, and thus forms the bunch or belly of the Glaſs. The matter, by this ſecond blaſt, aſſumes the figure of a gourd or callebaſh, eighteen or twenty inches in diameter.

As often as the operator blows into the iron, which muſt be very often, he removes it haſtily from his mouth to his cheek, leſt he ſhould draw the flame into his mouth, when he applies it again to the iron.

Then he whirls the iron many times round his head to lengthen and cool the Glaſs; ſometimes the Glaſs, being thus blown round, is returned to the fire, where it flattens a little of itſelf; when flatted, it is taken out and cooled; and, if it be required as to the form intended, the workman flattens the bottom a little, by preſſing it on the marble, or moulds it in the ſtamp irons; and thus delivers it to the maſter workman, to break off the collet.

The collet, or neck, is the narrow part which clove to the iron: To ſet the Glaſs at liberty, they put a drop of cold water on the

the collet, which by its coldneſs cuts or cracks a quarter of an inch; after which, by giving it a ſlight knock, the fracture is communicated all round the collet, and it drops off; the waſte piece of Glaſs is knocked off the iron, and thrown by to make green Glaſs.

This being done, the iron rod or ponteglo is dipped into the melting pot, and, with the matter that ſticks thereto, they apply and faſten it to the bottom of the veſſel, oppoſite to the collet.

The veſſel, thus ſuſtained by the iron rod, is carried to the great bocca to be heated and ſcalded; and, while another perſon takes care thereof, the former operator reſts and prepares himſelf for the branching.

The branching is making the bowl: To do this, they thruſt in an iron inſtrument, called paſſago, and augment and widen the aperture opened thereby with the procello.

In turning this inſtrument about to form the bowl, the edge becomes thickened, the glaſs being as it were doubled in that part; whence proceeds the hem, obſerved on the circumference of our glaſſes. What is ſuperfluous they cut off with ſhears.

The veſſel, being thus opened, is returned to the great bocca, where it is ſufficiently heated a ſecond time; and then the operator gives the bowl its finiſhing, by turning it about with a circular motion, which it increaſes in proportion as the bowl opens, and enlarges by means of the heat and agitation.

The Glaſs, being thus finiſhed, is carried from the bocca, ſtill being turned round, to a kind of earthen bench, covered with brands or coals extinguiſhed; here they let it cool a little, and come to its conſiſtence, having firſt ſeparated it from the iron rod by a ſtroke or two with the hand.

Thus, by blowing, preſſing, ſcalding, amplifying, and cutting, the Glaſs is brought into the form that the workman had firſt deſigned in his mind.

When a number of them has been finiſhed by the maſter, if the veſſels require it, he puts on a foot and handles, &c. and with the ſpici puts on rigarines and marblings; then a ſervitor takes them on an iron fork, and places them in the tower of the leer, to anneal and harden.

What has been here ſaid of white or cryſtal Glaſs, is the ſame as to the making of common or green Glaſs, the working part being the ſame in all; the difference being in the polverine or ſalt made uſe of.

So many maſters as there are, ſo many pots at the leaſt, and ſo many bocca's there muſt be, each man having his proper ſtation; where, ſays Dr. Merret, they receive thoſe ſcorching heats, ſallying directly into their faces, mouths, and lungs; whence they are forced to work in their ſhirts, with a ſtraw broad-brimmed

hat on their heads, to defend their eyes from the exceſſive heat and light. They ſit in large wide wooden chairs, with two long elbows, to which their inſtruments are hung.

They work ſix hours at a time, meaſured by a ſingle Glaſs; after which they relieved by others, for the like time; ſo that the furnaces are never idle.

The method of working or blowing window or table GLASS. The method of making crown window Glaſs, now practiſed in England, is ſaid to have been borrowed from the French.

An Engliſh glaſſmaker, going over, wrought in France, on purpoſe to let himſelf into the ſecret; which when he had attained to, he came back, and ſet up a Glaſs-work, wherein he far excelled the French, his teachers.

This Glaſs is blown much after the ſame manner as looking Glaſs, as follows:

The furnace, melting pots, materials, and fire are the ſame for window and table Glaſs as for round Glaſs; and the difference in the operation only begins after the ſervitor has dipped his blowing iron the fourth time in the melted metal.

The Glaſs then, being in this ſtate, is blown; but, inſtead of rounding or forming it into a bunch, the particular motion the workman gives it in the directing and managing the wind, and the way of rolling it on the iron, makes it extend in length two or three feet, and form a cylinder, which at firſt is but two inches diameter; but which, by being applied to the fire again, and blown afreſh after taking out, becomes of the extent required for the table Glaſs to be formed; but with this circumſtance, that the ſide which is faſtened to the iron goes gradually diminiſhing, and ends in a kind of cone or pyramid.

To render the two ends nearly of the ſame diameter, after adding a little glaſs to that oppoſite to the iron, they draw it out with a pair of iron pincers.

Then they cut off the ſame end with a little water, and, carrying the cylinder back to the bocca, they incide it likewiſe with water in two other places, one eight or ten inches from the iron, and the other the whole length.

Both the extremities of the Glaſs cylinder being thus taken off, it is heated on a kind of earthen table, ſomewhat raiſed in the middle, in order to promote its opening at the place incided, or cut lengthways.

In this the workman makes uſe of an iron, wherewith he alternately lowers and raiſes the two ſides or halves of the cylinder, which now begin to open and unfold like a ſheet of paper, and at length grow perfectly flat.

The table of Glaſs is now in its laſt perfection, and needs nothing farther but to be heated over again; which when it is taken out,

out, it is laid on a table of copper, where it having lain till it has cooled and come to its conſiſtence, it is carried on forks to the tower of the furnace, where it is ſet to anneal for twenty-four hours.

Formerly the tables were ſet into the annealing tower in great numbers, perhaps an hundred at a time, in a perpendicular ſituation, which was the occaſion that thoſe ſet in firſt, bearing in ſome meaſure the preſſure of all the laſt, were bent, and thus rendered unfit for uſe; but a way has been ſince found out to remedy this inconvenience, by ſeparating them into tens, with an iron ſhiver, which, by dividing the weight, diminiſhes it, and by that means preſerves the tables as flat as when they went in.

Glaſs, made much harder than any in the common way, may be made by means of borax, in the following method: Take four ounces of borax, and an ounce of fine ſand; reduce both to a ſubtile powder, and melt them together in a cloſe crucible ſet in a wind furnace, keeping up a ſtrong fire for half an hour; then take out the crucible, and when cold break it, and there will be found at the bottom a pure hard Glaſs, capable of cutting common Glaſs like a diamond. This experiment, duly varied, may lead to ſeveral uſeful improvements in the arts of Glaſs, enamels, and factitious gems; and ſhews an expeditious method of making Glaſs without any fixed alcali, which has been generally thought an eſſential ingredient in Glaſs; and it is not yet known, whether, calcined cryſtal or other ſubſtances being added to this ſalt inſtead of ſand, it might not make a Glaſs approaching to the nature of a diamond.

Of the different ſorts of table or window GLASS. There are divers ſorts of this Glaſs, made in divers places for the uſe of building.

Crown Glaſs, of which there are two kinds, diſtinguiſhed by the places where they are wrought, viz.

1. Ratcliff or Cock-hill crown Glaſs, which is the beſt and cleareſt, and was firſt made at the Old Bear-garden, at the Bank-ſide, Southwark: Of this there are twenty-four tables to the caſe, the tables being of a circular form, about three feet ſix inches in diameter.

2. Lambeth crown Glaſs, which is of a darker colour than the former, and inclining to green.

French Glaſs, called alſo Normandy Glaſs, and formerly Lorrain Glaſs, becauſe made in thoſe provinces: At preſent it is made wholly in the nine Glaſs works in France, of which five are in the foreſt of Lyons, and four in the county of Eu; the laſt at Beaumont, near Rouen. This is of a thinner kind than our crown Glaſs, and, when laid on a piece of white paper, appears

pears of a dirtyiſh green colour. There are but twenty-five tables to the caſe.

German Glaſs is of two kinds, white and green; the firſt is of a whitiſh colour, but ſubject to thoſe ſmall curved ſtreaks, obſerved in our Newcaſtle Glaſs, though free from the ſpots and blemiſhes thereof. The green, beſides its colour, is liable to the ſame ſtreaks as the white, but both of them are ſtraighter and leſs warped than our Newcaſtle Glaſs.

Dutch Glaſs is not much unlike our Newcaſtle Glaſs, either in colour or price: It is frequently much warped like that; and the tables are but ſmall.

Newcaſtle Glaſs is what is moſt uſed in England: It is of an aſh-colour, and ſubject to ſpecks, ſtreaks, and other blemiſhes, and beſides is frequently warped. There are forty-five tables to the caſe, each containing five ſuperficial feet; but ſome ſay thirty-five tables, and ſix feet in each table.

To tinge GLASS *of a deep red.* Opaque colours have a body, but the tranſparent ones none; for which reaſon this deep red muſt be mixed with matters that give it one, as ſhall be ſhewn.

Take twenty pounds of cryſtal frit, one pound of pieces of white Glaſs, and two pounds of calcined tin; mix the whole well together, and put it into a pot, and ſet it in a furnace that it may purify.

When it is melted, caſt in an ounce of calcined ſteel well pounded, and an ounce of ſcales of iron from the anvil well pulveriſed and mixed together; keep ſtirring the Glaſs well with an iron ſtirrer, while you are putting in the powder, to hinder it from riſing too much.

You muſt take care not to put in too much of the powder, for that would make the Glaſs black, whereas it ought to be clear, ſhining, and of an obſcure yellow colour.

Then take about ſix drachms of calcined copper prepared, caſt it upon the melted glaſs, often mixing it two, three, or four times, and the Glaſs will be as red as blood.

If the colour be as you would have it, you muſt work it off preſently, for fear it ſhould turn black, and the colour be loſt, of which great care muſt be taken.

But if, notwithſtanding this, the colour comes to be loſt, you muſt add more ſcales of iron in powder, and it will return.

To make a peach colour in GLASS. To make this colour, which is a very agreeable one, take Glaſs prepared and tinged of a milk-white, and, when it is in good fuſion, put in ſome manganeſe of Piedmont prepared, and that by little and little, ſtirring the matter well at each time, till the colour becomes as fine and perfect as you deſire it; but you muſt work the Glaſs in time,

time, otherwiſe the colour will be loſt; but by ſo doing you will have a very fair peach colour.

To make a gold yellow in GLASS. Gold colour, being one of the moſt noble and fineſt we can make, by reaſon of its imitating the moſt perfect metal in nature, muſt be made with the pureſt materials and greateſt precaution.

Take two parts of cryſtal frit, made with tarſo, and not with ſand, which is not ſo good, and one part of frit, compoſed of two thirds of tarſo, and one third of fine ſalt of polverine prepared; pound and mix them well, and, to each fifty pounds of this compoſition, add half a pound of tartar purified, pounded, and ſearced fine, and half a pound of manganeſs of Piedmont prepared, mixing theſe powders well with the two frits, becauſe you muſt not caſt them on the melted Glaſs, as in other colours. Then put the whole, by little and little, into a pot, and ſet them in a furnace, in which let them ſtand at an ordinary fire four days, for fear the Glaſs riſing ſhould run over.

When that matter is well purified, you may uſe it for making veſſels and what other works you pleaſe, which will be of a fair colour.

If you would have the colour yet clearer, you muſt add more powder, and you will have a very fine golden colour.

If you would have it yet finer, take fine cryſtal frit, made of polverine of rochetta, and the golden colour will be yet more fair.

To give GLASS *the colour of lapis lazuli.* Lapis lazuli, which is a fine blue, and full of veins of gold, will not be eaſy to imitate, without a great deal of care and induſtry in its preparation.

To make this fine colour, you muſt uſe the ſame matter as for the fine white; and, when it is in fuſion in the pot, you muſt add to it, by little and little, the blue enamel in powder, which is made uſe of by painters, mixing the whole well together each time, and that as often as there is occaſion to make this colour.

Then try it, whether the colour is to your mind, and, when it is, let it ſtand for full two hours, and make a ſecond eſſay of it; if the colour be perfect, let it ſtand ten hours, and then mix it again.

If it keeps in the ſame ſtate, without changing the colour, you may employ it in making what veſſels you pleaſe, which will be of the true colour of lapis lazuli.

If in working this Glaſs it happens to riſe, you may caſt in a little leaf gold, which will make the Glaſs approach yet nearer to lapis lazuli, and which will in a moment ſtop the riſing of the metal, as ſugar will do in boiling oil.

To make a milk-white colour in GLASS. To make the milk-white colour well requires no leſs exactneſs than the blue.

To

To ſucceed in it, take twelve pounds of good cryſtal frit, two pounds of calx of lead and tin, one of each, and half an ounce of manganeſe of Piedmont prepared; the whole being pulveriſed and mixed together, put them into a pot heated in the furnace; let it ſtand there for twelve hours; then mix the whole well, and make an eſſay of it.

If the colour does not pleaſe you, add to it ſome calx of the two metals before-mentioned, which incorporate with the Glaſs, mixing it well. In eight hours time after, the Glaſs will be fit to work, and as white as milk.

Another fairer and whiter colour. This ſecond way of giving a milk-white colour to Glaſs is much better than the precedent, and the work more exquiſite.

We only make uſe of calx of tin, without mixing any lead; and we put fifteen pounds of that calx to a hundred pounds of pure cryſtal frit, with twelve ounces of manganeſe of Piedmont prepared; the whole being well pulveriſed and mixed, put it into a pot heated in the furnace, there to purify during eight days.

Then caſt the matter into water, the better to purify it; then, after it has been dried, put it into the ſame pot to be melted again.

If it be tranſparent, you muſt add three pounds twelve ounces of the ſame calx of tin as before, mixing it well with the melted metal, to make it the better incorporate; and in twenty-four hours it will be finer and whiter than ſnow, and fit to be wrought.

To make common GLASS *become white and cryſtalline.* If you put in a convenient pot of frit polverine, you will have a common white Glaſs.

If you add ſalt of rochetta to this frit, you will have a very fair cryſtal Glaſs, which will be between ordinary Glaſs and cryſtal.

To make it very fine, you muſt add the ſame doſe of manganeſe of Piedmont, prepared as for cryſtal; for the manganeſe takes away all greenneſs in the Glaſs, and makes it very white.

If you would have a very fine Glaſs, you muſt always caſt the cryſtalline matter into common water; you may alſo do the ſame by common Glaſs, to bring it to perfection.

When this has been done, put the matter into the pot again, and, when it is melted, put it again into water, repeating this till it be purified and made fine.

To have Glaſs finer than ordinary, this caſting of it into water muſt be very exactly obſerved; for, beſides its whitening, it is there calcined and purified, and has fewer bliſters and puſtles.

But, to raiſe the matter to the greateſt perfection, mix fifty pounds of cryſtalline Glaſs, and as much common, and put to

it

it ten pounds of purified ſalt of tartar; that will give a Glaſs and cryſtal more than ordinary fine, provided you always take care not to mix it with the collets of the Glaſs, which has touched the iron rod; for they always make the Glaſs blackiſh, and are only fit for green Glaſs.

To make marble colour in GLASS. White marble, being very ſimple, it is eaſy to imitate; the way of doing it only requires cryſtal frit, which muſt be wrought as ſoon as it is melted, before it be purified, for ſo it will give a very fair marble colour.

Painting or ſtaining GLASS. The ancient or primitive manner of painting Glaſs was very ſimple, and conſequently very eaſy; it conſiſted in the mere arrangement of pieces of Glaſs of different colours in ſome ſort of ſymmetry, and conſtituted what is now called moſaic work.

In proceſs of time they came to attempt more regular deſigns, and alſo to repreſent figures heightened with all their ſhades; yet they proceeded no farther than the drawing the contours of the figures in black with water, and hatching the draperies after the ſame manner on Glaſſes of the colour of the object they deſigned to paint.

For the carnations, they uſed Glaſs of a bright red colour, and upon this they drew the principal lineaments of the face, &c. with black.

But in time the taſte for this ſort of painting improving conſiderably, and applying the art to the adorning of churches, baſilics, &c. they found out means of incorporating the colours in the glaſs itſelf, by heating them in the fire to a proper degree, having firſt laid on the colours.

The firſt notion of this is ſaid to have been given by a French painter of Marſeilles, after he had been at Rome, under the pontificate of Julius II. But the firſt who carried it to any heighth were Albert Durer and Lucas Van Leyden.

The colours uſed in painting or ſtaining of Glaſs are very different from thoſe uſed in painting either in water or oil colours.

In the windows of ancient churches, &c. there are to be ſeen the moſt beautiful and vivid colours imaginable, which far exceed any of thoſe uſed by the moderns; not ſo much, becauſe the ſecret of making thoſe colours is intirely loſt; as that the moderns will not go to the charge of them, nor be at the neceſſary pains, by reaſon that this ſort of painting is not now ſo much in eſteem as it was formerly.

Thoſe beautiful works which were made in the Glaſs-houſes were of two kinds.

In ſome the colour was diffuſed through the whole ſubſtance of the Glaſs; in others, which were the more common, the colour was only on one ſide, ſcarce penetrating even the ſurface

more

more than one third of a line, though this was more or leſs according to the nature of the colour, the yellow being found always to enter the deepeſt of any colour.

Theſe laſt, though not ſo ſtrong and beautiful as thoſe mentioned before, were of more advantage to the workmen, becauſe that they could on the ſame Glaſs, though already coloured, ſhew other kinds of colours, where there was occaſion to embroider draperies, inrich them with foliages, or repreſent other ornaments of gold, ſilver, &c.

In order to this, they made uſe of emery, grinding or wearing down the ſurface of the Glaſs, till ſuch time as they were got through the colour to the clear Glaſs; this done, they applied the proper colours on the other ſide of the Glaſs.

By this means the new colours were hindered from running and mixing with the former, when they expoſed the Glaſſes to the fire, as will appear hereafter.

When the intended ornaments were to appear white, the Glaſs was only bared of its colour with emery, without tinging the place with any colour at all; and this was the manner by which they wrought their lights and heightenings on all kinds of colours.

The firſt thing to be done, in order to paint or ſtain Glaſs in the modern way, is to deſign and even colour the whole ſubject on paper.

2. To chuſe pieces of Glaſs proper to receive the ſeveral parts.

3. To divide or diſtribute the deſign itſelf or papers, it is drawn on into pieces ſuitable to thoſe of the Glaſs, always taking care that the Glaſſes may join in the contours of the figures, and the folds of the draperies.

4. To order them ſo that the carnations may not be impaired by the lead, with which the pieces are to be joined together.

5. Having made the diſtribution, take care to mark all the Glaſſes as well as papers, that they may be known again.

6. Then applying each part of the deſign upon the Glaſs intended for it, to transfer the deſign upon the Glaſs with the black colour diluted in gum water, by tracing and following all the lines and ſtrokes, as they appear through the Glaſs, with the point of a pencil.

7. Then the Glaſſes muſt be ſet by till they are thoroughly dry, which will be in about two days; then the work being in black and white, is to have a ſlight waſh over with urine, gum arabic, and a little black, and repeated ſeveral times, according as the ſhades are deſired to be heightened, with this precaution, never to apply a new waſh till the former is ſufficiently dried.

This done, the lights and riſings are given by rubbing off the colour

colour in their reſpective places, with a wooden point or the handle of the pencil.

Then, having all your colours in a readineſs, fill your pieces with colours, for which uſe the nib of the pencil, eſpecially in carnation, where you muſt be very exact; you muſt alſo be very circumſpect and expeditious, and take a great deal of care not to blot or blur the tracings, and chuſe rather to paint on the other ſide of the Glaſs.

All the colours, except yellow, may be applied on the ſame ſide, and that you muſt do on the contrary ſide, becauſe it is apt to mingle with the other colours, and, if near the blue, will compoſe a green; ſo that, for want of ſuch precaution, the whole work may be ſpoiled; if the yellow tranſmit itſelf perfectly through the quarry, it is as well as if it had been done on the ſame ſide; and take notice by the way, that the other colours have not ſo ready a tranſition, becauſe they conſiſt of a groſſer body.

The yellow ought to be very equally and juſtly laid on in a greater or leſſer quantity, as you would have your ſhadows; obſerve this too in the reſt, eſpecially to lay them on as quick as poſſible, as we have already ſaid; particularly the azure green and purple require the moſt exactneſs of any.

Now to ſet off and heighten the lights, in piling a beard, deſcribing hair in drapery, or otherwiſe, uſe the handle or butt-end of the pencil, a ſmall pointed ſtick or quill, wherewith take off the colours in thoſe places you would enlighten, which is eaſily done.

Such works as are done in griſaille you muſt paint after this manner: Trace your piece with black, and let it dry for two days intirely; do it over very lightly and equally with a waſh ſo thin laid on as not to efface the firſt lines, and let it dry for two days; after this, run them over again with the ſame waſh where you find it convenient to give a ſecond tinge, and let it dry two days longer; then, to give it the lights and convenient heightening, take the ſharp butt-end of your pencil or pointed ſtick or pen as before, and take off the colour of the firſt waſh in the moſt neceſſary places, and ſo your work will be finiſhed.

To make this waſh is eaſy; take a ſmall pewter cup or other veſſel, and put therein a quantity of black colouring; then diſſolve gum arabic powdered in its weight of wine, throw this on the black in the pewter diſh or ſawcer, that it may be very clear and not eaſily dried, and that you may have your waſh for painting Glaſs in griſaille or gray.

A furnace for painting the GLASS *and ſettling the colours.* This furnace muſt be ſquare, of good brick, two feet high, and ſo much every way, and have three diviſions; the undermoſt for

the aſhes muſt be ſix inches high; the middle one for the fire, and to put in the fuel, muſt be ſix inches high, and have its opening five or ſix inches broad, and four deep, with a good iron grate of three ſquare bars of iron, which croſs the furnace and divide it in the middle to ſupport the earthen ſtove hereafter deſcribed; the uppermoſt diviſion muſt be a foot high, with a little opening about the middle before of four inches high, and two wide, to put in and draw out the ware a baking, to ſee if it be well done.

In this uppermoſt diviſion muſt be put the aforeſaid ſtove of good fire-proof crucible earth, the bottom an inch and a half thick, and from thence up to the brim ten inches full; it muſt be ſquare as the furnace, and have two inches room on all ſides, that the fire may flame round about it to bake the work, therefore placed exactly in the middle of the ſurface. There muſt be alſo in the fire-part of this ſtove an opening juſt againſt, and of the ſame ſize and form as that of the furnace, for the conveniency of putting the ware in and out.

To make this clearer, obſerve:

The letter A (plate XXI.) is the aſh-hole for the aſhes that fall from above through the iron grate; and note, that, the wider the opening is, the more violent the fire will be.

The letter B is the fire-place.

The letters C are the three ſquare iron bars to ſupport the pan for the ware.

The letter D is the opening of the furnace and pan, through which the ware muſt be conveyed in and out.

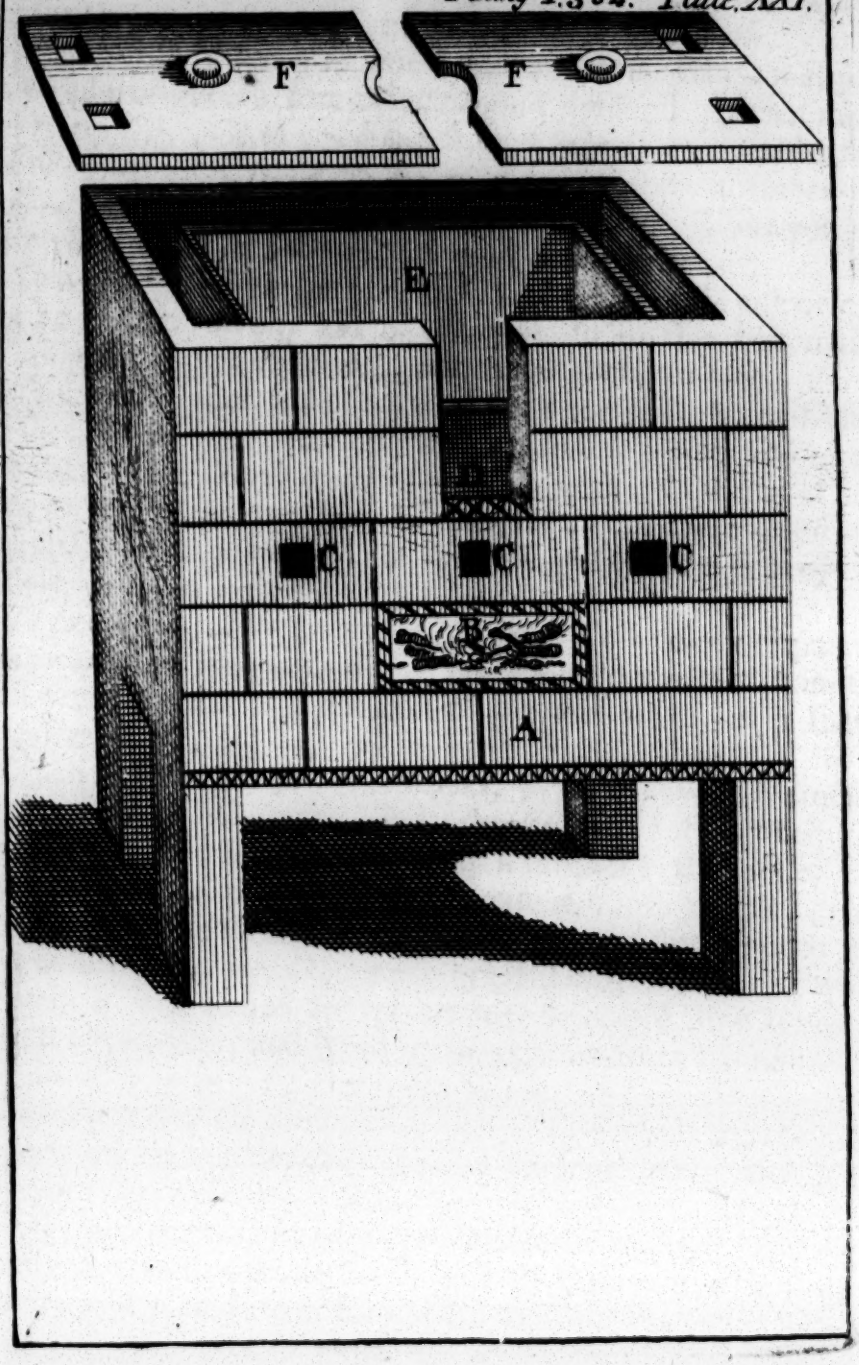
The letter E is the earthen pan, wherein all the painted ware muſt be baked.

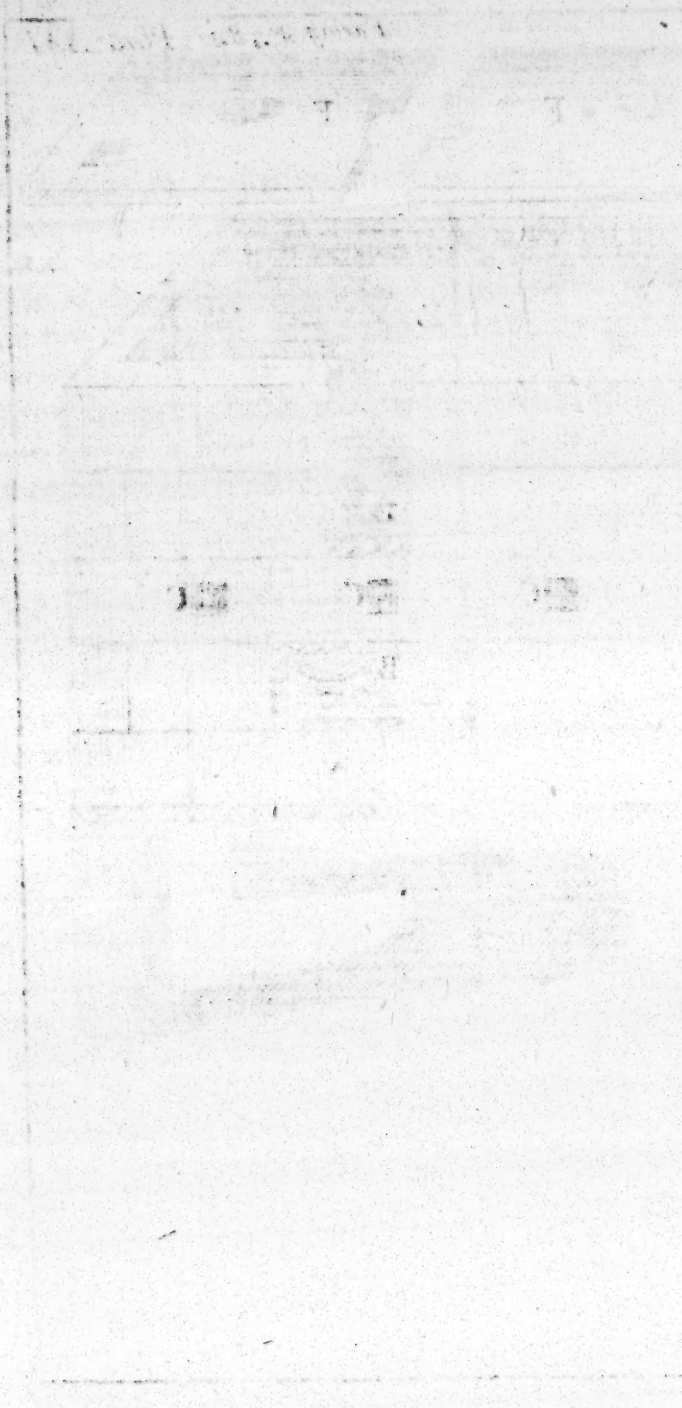
The letters F are two half lids of potters earth for covering the whole furnace above. As ſoon as the ſtove is full of ware, the lids muſt be well cloſed and luted together, to prevent the air coming in any where but by the four ſquare holes at both ends, and the two ſemicircles in the middle, in which make a round hole for a chimney, when the two half lids are cloſed. Theſe five holes are for letting out the ſmoke and flame of the furnace.

To make white ground for painting on GLASS. Now, to purſue our work, we will begin with the preparation of all the colours to be uſed in painting Glaſs; for, before we proceed to preſcribe the rules how to work, the materials muſt be conſidered.

The white is compounded of ſeveral ingredients; the firſt are ſmall white river pebble-ſtones heated red-hot over a fire in an iron ladle, and thrown afterwards into an earthen diſh full of cold water to calcine them; and this muſt be repeated ſeveral times until they be prepared; afterwards being dried, pound them with

Facing P. 384. Plate XXI.





with a ſtone or glaſs peſtle in a ſtone mortar, and ſo grind them upon a marble to an impalpable powder; then mix a fourth part of nitre with it, and calcine them in a crucible; then pound and grind them again, and calcine them a third time over a ſmaller fire than your former, and ſo take them off for uſe.

This done, when you would paint with it, add equal parts in weight of gyp, a ſort of talc found amongſt plaiſter mould baked on the coals to a whiteneſs, and reducible to powder, and rocaille, ſee ROCAILLE; grind them all three together in a hollow plate of copper with gum arabic water. Thus you will have your white in good condition to paint withal.

To prepare black for painting on GLASS. As this colour cannot be omitted in any ſort of painting, ſo in this the manner of uſing it is much the ſame, and the preparation eaſy.

You muſt grind ſcales of iron from the ſmith's anvil-block for three hours on the ſhallow copper baſon or plate; add to this one third of the ſame weight of rocaille, with a little calx of copper, to hinder the iron from turning red in the fire; grind it to as impalpable a powder as you can bring it to, and ſo keep it in a cloſe veſſel for uſe.

To prepare a yellow paint for GLASS. This colour requires a more coſtly preparation than the precedent, becauſe it cannot be well done without a tenth part of prepared ſilver, as is ſhewn hereafter.

Take fine ſilver in plates or leaves, ſtratify them in a crucible with powder of ſulphur or nitre, the firſt and laſt lay being of the powder, and ſo calcine them in a furnace; this done, caſt it out as ſoon as all the ſulphur is conſumed into an earthen baſon of water, and afterwards pound it in your ſtone mortar until it is fit for the marble, and ſo grind it with ſome of its water wherein it was cooled for ſix hours; then add nine times its weight of red oker, and grind them together for a full hour, and it is done, and fit for painting on Glaſs.

To make a blue for painting GLASS. The whole ſecret of this preparation depends on the calcining the ingredients, and goodneſs of the crucible.

Take two ounces of zaffer, two ounces of minium, and eight ounces of very fine white ſand; put all theſe into a bell-metal mortar, and pound them very well, and ſo into a crucible covered and luted over a quick fire for an hour; then draw out the crucible, and pound them again as before; this done, add a fourth of its weight in ſalt-petre powdered, and, having mixed all very well together, return them into a crucible covered and luted, which place again in the furnace for two hours at leaſt, continuing ſuch another fire as the former. The crucible being off, and cooled a ſecond time, grind the maſs as before, and ſo put it

into a crucible again, with a ſixth part of ſalt-petre, and let it remain on the fire for three hours; then take off the crucible immediately with an iron ſpatula red-hot, and take out the matter, leſt it ſhould ſtick, being very clammy and hard to be emptied.

It is convenient to have ſtrong crucibles for this calcination, becauſe it remains ſo conſiderable a while in the fire, and they muſt be luted with an extraordinary lute, adding powder of borax to the powder of Glaſs vitrified, which helps the fuſion of the Glaſs which we have omitted there; but the greateſt ſtreſs lies in baking the crucible afterwards in a ſmall fire to cement the pores, and make the earth compact as Glaſs, which would be very much furthered, if you would throw on it a conſiderable quantity of ſalt as it comes out of the fire. This would glaze it, and capacitate it for retaining the ſpirits in the fire.

To make a red colour for GLASS *paint.* This requires as much caution as the blue.

You muſt take ſcales of iron, and litharge of ſilver, of each a drachm; feretto of Spain, half a drachm; rocaille, three drachms and a half; grind all theſe for half an hour on a ſhallow copper-plate; in the mean time, pound three drachms of blood-ſtone in an iron mortar, and add it to the reſt; then pound a drachm of gum arabic in that mortar to an impalpable powder to take off the remains of the blood-ſtone, and ſo add it to the reſt, grinding them ſtill continually, leſt the blood-ſtone be ſpoiled.

The beſt manner of grinding theſe is to pour water by little and little on the ingredients as you grind them, neither wetting them too much nor too little, but juſt as much as will keep a good temper, as for painting; afterwards put all into a foot Glaſs, and ſo drop on it through a ſmall hollow cane of wood, or with your finger, as much water as will bring it to the conſiſtence of an egg's yolk buttered, or a little more; then cover the Glaſs to preſerve it from duſt, and ſo let it ſtand three days to ſettle.

After this, decant the cleareſt and pureſt of the colours that riſe at the top into another Glaſs, without diſturbing the ſediment; and, two days after it has ſettled anew, pour off again the pureſt of the colours as before.

This done, ſet it in the body of a broken mattreſs or bolt-head over a gentle ſlow fire to dry eaſily, and ſo keep it for uſe.

When you have occaſion for it, take a little fair water in a Glaſs, and with it moiſten as much colour as you think convenient; that will be excellent for carnation. As for the fæces which are very thick, dry them too, and you may moiſten theſe in like manner with water for drapery, timber colour, and ſuch others as you think convenient.

It is true all painters of Glaſs do not uſe theſe colours thus pre-

pared, there being few artiſts of that kind, who have not invented their own particular colours, which they eſteem as great ſecrets.

But nevertheleſs they that have been above deſcribed are ſufficient for the beſt paintings of all ſorts, provided the workman has but the ſkill to manage them.

To make a purple colour for painting of GLASS. The preparation of this purple colour is exactly like that of the blue; for this reaſon we need not uſe any tedious repetitions.

You muſt take an ounce of zaffer, and an ounce of very pure and clear perigueux, two ounces of minium, eight ounces of very fine and white ſand; pound all theſe in a bell-metal mortar, and reduce it to an impalpable powder; put it afterwards into a good crucible well covered and luted in the furnace; keep a very good fire to it for an hour; then draw it out, and as ſoon as it is cold pound the maſs over again in the ſame mortar; to this add a fourth part of its weight of nitre; mix them together, and put them into a crucible, and ſo proceed until you have a fine purple colour.

To make a green paint for GLASS. The change of the ingredients makes this colour; but the method for incorporating them is the ſame as the former.

Take two ounces of æs uſtum; to this add two ounces of minium, and eight ounces of very fine white ſand; pound theſe together in a metal mortar to an impalpable powder, and put it afterwards in a crucible luted and covered into a wind furnace, giving it a good fire for an hour; after this, draw it off, and let it cool; then pound it again, adding a fourth part of its weight of nitre in powder; grind and mix them well together, putting them afterwards into a crucible luted and covered in the furnace for two hours, and then you will have a very fine green.

Of other colours in general for painting of GLASS. We have directed how to make the firſt maſter colours for painting on Glaſs; now we proceed to ſhew what others depend on them without enlarging on theſe preparations.

The red ſerves for carnation; but there ought to be one part of feretto of Spain in the compoſition, and another of rocaille; grind theſe on your copper-plate, imbibing the powder with gummed water until it be made fit for uſe.

The red fæces there alſo mentioned will ſerve in drapery; and to deſcribe timber-work, trunks of trees, hair, brick, and ſuch other things, you muſt take an ounce of feretto of Spain as in the former compoſition, an ounce of iron ſcales, and two ounces of rocaille; grind them together on the copper-plate, moiſtening them with gum water till they be brought to a proper conſiſt-

ence, neither too thick nor too thin; ſo you will have a red inclining to a dark yellow, very fit for uſe.

There are ſeveral more made uſe of in this, as well as in other painting, but are compounded of the principal colours as we have intimated in our diſcourſe of colours for painting on enamel.

Another way to paint on GLASS. Take very white Glaſs, varniſh it very thin on one ſide with a white varniſh; then, having made choice of ſome fine impreſs cut on paper juſt fit for the piece of Glaſs you deſign to paint on, dip it in water, and, letting it ſoak and dry a little, clap the picture ſide thereof to the varniſh ſide of the Glaſs, as exactly plain and even as poſſible, and ſo let it dry thoroughly; afterwards moiſten the paper on the blank ſide, and with a blunt graver draw off and trace the lines of the picture, which will afterwards remain perfectly and diſtinctly on the varniſh ſide of your Glaſs quarry.

This draught is for the model; you muſt paint your filings in it, and obſerve that the tracings and ſtrokes of the picture are to ſerve you in ſhadowing, which cannot be repeated without diſadvantage to your piece.

The manner of painting on Glaſs is quite contrary to that of limning or painting on cloth or wood; for in this the paint, being but on one ſide, is plainly viſible on the other. Here the ſettings off are firſt done; then the compound colours juſt run over, and ſo continuing until perfected: Whereas on linen, &c. the ſetting off or heightenings are the laſt ſtrokes, and their ground colour or firſt is that which we end withal, and make our laſt lay in all pieces done on Glaſs.

We do not ſhew the way to make up the colours, nor how to mix and finiſh the artificial ones, for that relates immediately to the art of painting, of which you will find in ſeveral other articles, and not to this art of Glaſs-painting; and theſe noted herein are the ſame as in the other art of painting on cloth, and not very eaſily prepared.

You muſt alſo paint on Glaſs juſt as in miniature with water colours, laying your picture underneath it as before; and this will ſhew finer than if done in oil, beſides the colours dry in a moment.

Your pieces being thus done in oil, or water colours, may receive a very additional and improving beauty by overlaying all the colours, except the ground, with leaf ſilver, which will appear very glorious and lively on ſuch as are tranſparent, to wit, lakes, verditers.

General remarks for all colours. The firſt time a new pot is put into the furnace, it always leaves ſome ſully or foulneſs on the Glaſs, which ſpoils the colours; for this reaſon they always begin to melt white Glaſs in it firſt, which afterwards they pour

out again into another veſſel, to make common glaſs of it. This the workmen very well know; but, the ſecond time, there will appear nothing of this foulneſs.

Particular care muſt be taken, when you prepare materials for tinging Glaſs, the moſt whereof are extracted from minerals, to do it in a ſeparate furnace, or not have any veſſels in it that you uſe for cryſtalline materials; for the ſmoke of metals and minerals makes cryſtal pale and uneven. The veſſels or pots which ſerve for one colour muſt not be made uſe of for another, and every colour ought to have its own pot.

Care muſt alſo be taken not to calcine materials more than is neceſſary, for then they burn and are good for nothing.

As a proportion ought to be kept and minded in every thing we do, ſo we will here lay down ſome which muſt not be exceeded whether for fruit or colours. Notwithſtanding when the workman makes any aſſay, if his colour be not deep enough in his mind, he may add as much as he ſhall think neceſſary, which ſometimes depends on the preparation of the metals more or leſs calcined, and often on the fancy of the workman.

It is neceſſary alſo to be obſerved, that all the doſe of the colouring ought not to be thrown on the melted glaſs at once, but at ſeveral times, and in proportion according to the quantity of it, ſtirring each time the materials, that they may both incorporate, and at the ſame time prevent them from riſing and running over.

How to order the GLASS *in the furnace after it has been painted.* After the Glaſs has been completely painted, and the draughts perfectly finiſhed, the difficulty remains in baking the pieces, ſo as to give it a conſiſtency with the Glaſs, by penetration, which is to be done as follows.

You muſt work with the furnace here deſcribed, and its ſtove made of good crucible earth, to contain all the work, which muſt be ſtratified in the following manner:

Take good quick lime well digeſted, powdered, and finely ſearced, and, for the better ſecurity, let it be digeſted three times in a potter's furnace, and then powder and ſearce it; then lay it very even about half an inch thick on the bottom of the ſtove, and upon that a layer of pieces of broken Glaſs, and upon that another layer of the powder, and ſo another of Glaſs, then another of powder; the reaſon of making this ſtratification of powder and old glaſs is to prevent any injury from the violence of the fire, which will be very intenſe under the ſtove.

This done, upon the third bed or layer of powder lay a layer of painted Glaſs, and ſo continue to lay layer upon layer, each lay of powder and Glaſs being evenly made until all the pieces of painted Glaſs are put in or the ſtove full, and upon the laſt lay

of Glaſs lay a layer of the powder ſomewhat thicker than the former.

Then cover the furnace with its ſhrowds of earth, joining and luting them well together all round with the beſt lute, ſo that it may admit of no reſpiration, but through the fire-holes or the opening of the furnace; while you draw out the proofs for trials, by ſome called watches, which are bits of broken Glaſs painted with the colours, and put in purely for the purpoſe of taking out and examining how the work goes on.

Having thus ordered the furnace, and the lute being well dried, begin to heat it gently with ſome charcoal on the outſide of the furnace at the entrance, and ſo proceed by degrees, and very leiſurely heightening it, leſt it ſhould break the Glaſs, or ſpoil the paint.

Continue this for two hours, then thruſt the fire in further, and let it remain there for an hour, putting it in by little and little under the ſtove, where let it ſtand two hours longer; then increaſe the fire by degrees for two hours, and ſo continue to apply fuel till the furnace be full of charcoal, and you perceive the flame to convey itſelf through every hole of the cover; keep it thus violent for three or four hours, ſhutting the door of the furnace.

You muſt be very cautious and careful, during the whole work from the firſt two hours, that the fire remains at the entrance.

From time to time you muſt draw out ſome of the pieces of Glaſs that you put into the ſtove for trials or watches, to ſee if the colours be melted and the yellow be qualified. You may perceive how the work goes on by the ſparkling of the iron bars under the ſtove.

As ſoon as you find the colours almoſt done, improve the fire with ſome very ſmall billets of dry wood; theſe muſt be very ſmall that they may be put in the more eaſily, ſmoke the leſs, and to make the flame inviron, reverberate over and round about the ſtove, which muſt be continued till the work is finiſhed, which will be in twelve or fourteen hours; then let the fire go out, and the work cool of itſelf; then it will be finiſhed, and take it out, or elſe it would ſoon burn the colours and break the Glaſſes.

GLASS *porcelain*, the name given by many to a modern invention of imitating the China ware with Glaſs.

The method given by Mr. Reaumur, who was the firſt who carried that attempt to any degree of perfection, is delivered by that gentleman, in the memoirs of the Academy of Sciences of Paris; to this effect:

The mixing Glaſs, reduced to powder, with other leſs eaſy vitrifiable ſubſtances, for the forming a paſte, to be afterwards made into a ſort of porcelain, has been a contrivance long practiſed,

ſed, but is very troubleſome, and the reſult ſubject to many faults; but this new ware is made of Glaſs alone, and that with much leſs trouble, and without the reducing it to powder. By this art veſſels of Glaſs are changed into veſſels of a ſort of porcelain, without altering their form; and the meaneſt Glaſs ſerves as well as the beſt for that purpoſe; our common coarſe green quart bottles, or the great bell Glaſs, with which gardeners cover their melons, &c. being, by this means, changeable into a beautiful white ſort of porcelain ware: And this is to be done in ſo eaſy a manner, and at ſo ſmall expence, that it requires no more trouble or charge than that of baking a common veſſel of our earthen ware. And, for this reaſon, the veſſels of this ſort of ware may be afforded extremely cheap. It is very certain that all porcelain ware is a ſubſtance in a ſtate of ſemivitrification; and, in order to bring Glaſs, which is a wholly vitrified ſubſtance, into the condition of porcelain, there requires no more than to reduce it to a leſs perfectly vitrified ſtate.

The queſtion which would naturally be ſtarted, on this occaſion, is, whether it be poſſible to reduce Glaſs to a leſs vitrified ſtate, it having already undergone what is eſteemed the laſt change by fire. But when we conſider that the Glaſs of antimony, the vitrifications of many of the metals, as the Glaſs of lead, and the counterfeit gems, coloured by the metals, are more or leſs eaſily reduced again, by chemiſtry, to metals, &c. the reducing ſand, flints, &c. after they are vitrified, at leaſt a little way back towards their native or priſtine ſtate, may appear not wholly impracticable, and the attempts which Mr. Reamur made on this occaſion, were what gave him the firſt hints of the Glaſs porcelain. The method of making it is this: The Glaſs veſſels, to be converted into porcelain, are to be put into a large earthen veſſel, ſuch as the common fine earthen diſhes are baked in, or into ſufficiently large crucibles; the veſſels are to be filled with a mixture of fine white ſand, and of fine gypſum, or plaiſter ſtone, burnt into what is called plaiſter of Paris; and all the interſtices are to be filled up with the ſame powder, ſo that the Glaſs veſſels may no where touch either one another, or the ſides of the veſſel they are baked in. The veſſel is then to be covered down and luted, and the fire does the reſt of the work; for this is only to be put into a common potters furnace, and, when it has ſtood there the uſual time of the baking the other veſſels, it is to be taken out, and the whole contents will be found no longer Glaſs, but converted into a white opaque ſubſtance, which is a very elegant porcelain, and has almoſt the properties of that of China.

GLAUCUS, a ſea deity, repreſented, as Philoſtratus ſays, with a long white beard and hair, ſoft and dropping about his

ſhoulders; his eyes green and glittering; his brows full of wrinkles and green ſpots; his breaſt all overgrown with greeniſh ſea-weeds or moſs; his belly, and from thence downwards, fiſh-like, full of fins and ſcales.

To paint GLOBES, &c. *of various colours.* Put warm gum water into a Globe, and roll it about in it, ſo that it be wetted all over; then put it out again; then, your colours being all ready, with or through a hollow pipe, blow them into the Globe.

1. Vermilion to repreſent clouds or wavings.
2. Powder of blue enamel.
3. Powder of copper ſcales.
4. Orpiment in powder.
5. Lake in fine powder.
6. Water gold in powder.
7. Leaf ſilver in powder, or any other colours you like better.

You may blow them to what parts of the Globe you pleaſe, by directing the pipe accordingly. Having done this, put a good quantity of plaiſter in fine powder into the Globe, and ſhake it well all over, before and till the gum water is dry, and ſo will it ſtick faſt round about; and what remains looſe ſhake it out, and ſo will the outſide of the Globe be finely marbled and coloured.

To make the gum water. Put two ounces of gum arabic or rather mouth glue in a quart of fair water, let it digeſt for two or three days in warm water; then boil it gently till all is melted, and ſtrain it through a flannel while it is hot, and keep it for uſe.

GLORY, is repreſented, in painting, by a beautiful woman; the upper part of her body is almoſt naked; ſhe bears a ſphere, whereon are the twelve ſigns and a little image, holding a palm in one hand, and a garland in the other.

Her nakedneſs intimates, that ſhe needs no painting, her actions always being expoſed to view; the ſphere, that mundane conſiderations do not ſo oblige her to heroic actions as the celeſtial do. The tokens of victory ſhe holds, intimate, that theſe two are inſeparable, the one produces the other.

GLORY *of princes*, is repreſented, in painting, as a very beautiful lady with a golden circle about her forehead, interwoven with many precious jewels; her golden locks ſignify the magnanimous thoughts that poſſeſs the minds of princes. She holds a pyramid ſignifying their glory in cauſing magnificent fabrics to be erected, ſignaliſing them to poſterity.

GLUE, a tenacious viſcid matter, which ſerves as a cement to bind or connect divers things together.

There are divers kinds of Glues made uſe of in divers arts, as the common Glue; glove Glue; parchment Glue; but the two laſt are more properly called ſize.

The

The common or ſtrong Glue is uſed by various kinds of artificers, joiners, cabinet-makers, &c.

The beſt is that made in England in ſquare pieces of a ruddy brown colour: Flanders Glue is accounted the next in goodneſs to the Engliſh.

Glue is made of the ſkins of all kinds of beaſts, as oxen, cows, calves, ſheep, &c. the older the beaſt is, the better is the Glue made of its hide.

Indeed whole ſkins are but very rarely uſed for this purpoſe, thoſe being capable of being applied to better purpoſe; but they make uſe of the ſhavings, parings, or ſcraps of it; ſometimes it is made of the feet, ſinews, nerves, &c. of beaſts. That made of whole ſkins is the beſt, and that made of the ſinews is the worſt; and hence ariſes the difference of Glues, for, as our tanners generally make the Glue themſelves, they are not ſparing of the parings of the ſkins, which they never ſell; whereas in France, the Glue-makers being a peculiar kind of manufacturers, and having no parings, &c. but what they buy, they make uſe chiefly of ſinews, feet, &c.

The method of making GLUE. In making Glue of parings they firſt ſteep them two or three days in water; then waſhing them well out, they boil them to the conſiſtence of a thick jelly.

Then they paſs this jelly while hot through oſier baſkets, to ſeparate the impurities from it; and then let it ſtand ſome time, to purify it further; when all the filth and ordures are ſettled to the bottom of the veſſel, they melt and boil it a ſecond time.

Then they pour it into flat frames or moulds; whence it is taken out pretty hard and ſolid, and cut into ſquare pieces or cakes. They afterwards dry it in the wind in a ſort of coarſe net, at laſt ſtring it, to finiſh its drying.

The Glue made of ſinews, feet, &c. is managed after the ſame manner; only with this difference, that they bone and ſcour the feet, and do not lay them to ſteep.

The ſureſt way to try the goodneſs of Glue, is to lay a piece to ſteep three or four days, and if it ſwell conſiderably without melting, and when taken out reſumes its former dryneſs, it is excellent.

Fiſh GLUE, is a ſort of Glue made of the nervous and mucilaginous parts of a large fiſh, found chiefly in the Ruſſian ſeas.

Theſe parts, being boiled, bear a near reſemblance to that viſcid matter found in the ſkins of cod-fiſh; when it is boiled to the conſiſtence of a jelly, they ſpread it on a leaf of paper, and form it into cakes; in which ſtate it is ſent to us.

A GLUE *that will hold againſt fire or water.* Mix a handful of quick lime with four ounces of linſeed oil; boil them to a good thickneſs, then ſpread it on tin plates in the ſhade, and it will become

become exceeding hard; but may be eaſily diſſolved over a fire, as Glue, and will effect the buſineſs to admiration.

GLUE. A ſtrong and fine Glue may be prepared with iſing-glaſs and ſpirits of wine, thus: Steep the iſing-glaſs for twenty-four hours in ſpirits of wine, or common brandy; when the menſtruum hath opened and mollified the iſing-glaſs, they muſt be gently boiled together, and kept ſtirring, till they appear well mixed, and till a drop thereof, ſuffered to cool, preſently turn to a ſtrong jelly. Then ſtrain it, while hot, through a clean linen cloth, into a veſſel, to be kept cloſe ſtopped; a gentle heat ſuffices to diſſolve this Glue into a tranſparent and almoſt colourleſs fluid, but very ſtrong; ſo that pieces of wood, glued together with it, will ſooner ſeparate elſewhere than in the parts joined.

GLUTTONY, is repreſented, in painting, by a woman in a ruſſet gown, with a long crain neck, and a pretty big belly, a hog lying by her.

Her belly denotes gormandiſing, as making her belly her God. The ruſty or ruſſet gown ſhews that, as ruſt eats iron, ſo does the glutton devour his ſubſtance; the hog denotes Gluttony.

G. M. E. ſignifies Giorgio of Mantua, in other pieces of the abovementioned Primaticcio.

GOLD, is a yellow metal, the heavieſt, pureſt, moſt ductile and ſhining, and, on thoſe accounts, the moſt valuable of all metals.

The weight of Gold is to that of ſilver, as 19 to 10; a cubic inch of pure Gold weighs twelve ounces two drachms and fifty-two grains; and the cubic inch of ſilver ſix ounces five drachms and twenty-eight grains.

The pound weight or twelve ounces Troy of Gold is divided into twenty-four carats.

The value of Gold is to that of ſilver, as 14 to 1; ſtandard Gold is worth 44 l. 10 s. ſterling the pound weight; ſtandard ſilver is worth 3 l. the pound, or 5 s. the ounce.

1. The firſt characteriſtic or property of Gold is, that it is the heavieſt of all bodies.

In every maſs of matter, heavier than mercury, there muſt of neceſſity be ſome ſhare of Gold more or leſs; there not being in nature any body of intermediate gravity, i. e. no body whoſe gravity is to that of Gold more than as 14 to 19.

2. Its ſecond character is; that, of all known bodies, it is the moſt ductile and malleable; and, of all bodies, its parts have the greateſt degrees of attraction, i. e. cohere with the greateſt force.

Of this Gold-beaters and wire-drawers ſupply us with ſufficient proofs.

3. The third character of Gold is its fixedneſs in the fire, in which it exceeds all other bodies.

4. The

4. The fourth character is, that it is not diſſoluble by any menſtruum in nature, except aqua regia and mercury.

5. The fifth character is, that it readily and ſpontaneouſly, as by ſome magnetic virtue, attracts and abſorbs mercury.

6. The ſixth character is, that it withſtands the violence both of lead and antimony, i. e. being fuſed in the coppel along with either of thoſe matters, it does not diſſipate and fly off with them in fume, but remains fixed and unchanged.

All other metals, except Gold and ſilver melted with lead, periſh with it, and evaporate by fire; and in all other metals, except Gold, and even ſilver itſelf, undergo the ſame fate.

The manner of ſeparating GOLD. The metalline ſtone is firſt broken pretty ſmall with an iron mallet; then it is carried to the mills, where it is ground to a very fine powder; and, laſtly, is paſſed through ſeveral braſs ſieves, the laſt of which is as fine as any of our ſilk ſieves.

The powder, being thus prepared, is laid on wooden troughs, with a proper quantity of mercury and water; and is there left to knead and ſaturate in the ſun and air for forty-eight hours.

After this, the water, with the recrementitious earth, is drove out of the tubs, by means of other hot waters poured thereon.

When this is done, there remains nothing but a maſs of mercury, with all the Gold that was in the ore.

The mercury is ſeparated from it by diſtillation in large alembics.

The Gold in this ſtate is called virgin Gold, as well as that found in the ſand of rivers, or that in grains in the mines, in that none of them have paſſed the fire.

After this, it is uſually fuſed in crucibles, and caſt into plates or ingots.

Virgin Gold, is Gold juſt as it is taken out of the mines, before it has undergone any action or preparation by fire.

Virgin Gold is ſaid to be very pale, and ſo ſoft, that it may be moulded into any figure with the hand; it will even take an impreſſion from a ſeal, like the ſofteſt wax. To harden it, as alſo to heighten its colour, they mix emery with it.

Fine or pure Gold, is that purged by fire of all its impurities and all alloy.

The moderns frequently call it Gold for twenty-four carats; but there is not in reality any ſuch thing as Gold ſo very pure; and there is always wanting at leaſt a quarter of a carat. Gold of twenty-two carats has one part of ſilver and another of copper; that of twenty-three carats has half a part, i. e. half a twenty-fourth of each.

In England, at this time, the ſtandard crown of Gold is twenty-two carats fine.

To make GOLD *ſofter.* Take mercury ſublimate, ſal armoniac, of each a like quantity; powder them, melt Gold, and put to it a little of this powder, and it will be ſofter.

Another way to do the ſame. Take vitriol, verdet, ſal armoniac, burnt braſs, of each one ounce; mix them with aqua-fortis, let it ſtand in the heat for two days, and then let it harden; do this three times with aqua-fortis, and let it dry; then reduce it to a powder, and to one drachm put an ounce of Gold three times, and it will be ſofter.

Or thus; quench Gold in water of ſal armoniac, and it will be ſofter.

Or thus; take honey and oil, of each a like quantity, quench Gold in it three or four times, and it will be ſofter.

To colour and ſoften GOLD. Diſſolve verdigreaſe in vinegar, and ſtrain it through a felt, then congeal it, and, when it begins to grow thick, put ſome ſal armoniac to it, and let it harden a good while; then melt the Gold with it, and it will heighten the colour and make it ſoft.

To make GOLD *and ſilver ſofter.* Take mercury ſublimate, ſal armoniac, of each a like quantity; powder them, melt the Gold, and put to it a little of this powder, and it will be ſoft.

Another way to do the ſame. Take vitriol, verdet, ſal armoniac, and burnt braſs, of each an ounce; mix them with aqua-fortis, and let it ſtand in the heat for two days; then let it harden; do thus three times with aqua-fortis, let it dry, and reduce it to powder. To an ounce of Gold put one drachm of it three times, and it will be ſofter.

The way of calcining GOLD. Diſſolve an ounce of Gold in three ounces of aqua regalis; then add to it four ounces of common mercury purified, and paſſed through waſh leather, which will precipitate the Gold to the bottom of the matraſs, joining itſelf to it.

Then the aqua regalis will grow clear, which, when it is, and ſeems to have no more Gold in it, decant it off, and then waſh your matter with warm water to dulcify it, and take away its ſaltneſs.

When the matter is dried, add to it its weight of flour of brimſtone; then pound the whole together, put them in a crucible, to which fit another at top, which muſt be bored at bottom with a hole big enough to put a quill through, which lute well together and dry them.

Then put them in a round fire, which you muſt give them by degrees for four hours, the crucible being, the laſt hour, wholly covered over with coals, which let kindle and cool again.

Then open the crucible and you will find the Gold calcined, which amalgamate with four ounces of freſh mercury; to which

add

add five ounces more of flour of brimſtone, pounding them well together as before; then put the whole into crucibles, lute them, and give them the ſame round fire as before; which reiterate a third time, as before, the better to calcine and open the Gold; then put it into a glazed earthen pan pretty deep, and pour on it good ſpirits of wine, that may ſwim two inches above; then put fire to it, and, when it is burnt, you will have a very fine Gold in an impalpable calx, well opened, which edulcorate with warm water diſtilled, and dry it gently.

Liquid GOLD *and ſilver.* Take five or ſix leaves of Gold or ſilver, and grind them with a ſtiff gum lake water, and a good quantity of ſalt, as ſmall as you can; then put it into a phial or glazed veſſel, add to it as much fair water as may diſſolve the ſtiff gum water; then let it ſtand four hours, that the Gold may ſettle; decant off this water, and put in more, till the Gold is clean waſhed; then put more fair water to the Gold, a little ſal armoniac and common ſalt, digeſting it cloſe for four days; then put all into a piece of thin glover's leather, whoſe grain is peeled off, and hang it up; ſo will the ſal armoniac fret away, and the Gold remain behind, which keep.

Or thus; grind leaf Gold, with ſtrong or thick gum water, very fine; and, while you are grinding it, add more thick gum water; being very fine waſh it in a great ſhell, as you do bice; then temper it with a little mercury ſublimate, and a little diſſolved gum to bind it to the ſhell; ſhake it, and ſpread the Gold about the ſides thereof, that it may be all of one colour and fineneſs, which uſe with fair water, as you do other colours.

To burniſh GOLD. Do the ſame as to liquid ſilver. Take gum lake and diſſolve it into a ſtiff water, then grind a blade or two of ſaffron with it, and you will have a fair Gold; when you have laid it and it is thoroughly dry, burniſh it with a dog's tooth.

Or thus; having written what you had a mind with your pen and pencil, cut the leaf Gold or ſilver into pieces, according to the ſize; take it up with a feather or cotton, &c. and lay it upon the writing or drawing, which preſs down with a piece of wool, and, being dry, burniſh it.

To make a very fine poliſhed GOLD. The woods you would gild muſt be very ſmooth; and, to render them the ſmoother, it will be proper to paſs ſea dog's ſkin over them.

Then ſize it over with a ſtuff or ſize made of the cuttings of white leather gloves, ſee SIZE; and, when it is thoroughly dry, lay on nine or ten layers of white.

When this is perfectly dry, uſe your ſhave-graſs, that you may render it ſo much the kinder; and then, having made ſome ſize

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and water warm, dip a linen rag into it, which wring out, and then rub the white.

Then lay on two or three layers of Gold colour, and more, if it be not of a good body or deep enough; and, when it is dry, rub it well with a dry cloth, till it is bright again; then take of the ſtrongeſt brandy you can get, and with a pencil-bruſh waſh the Gold colour with this brandy; and, having leaf Gold ready cut, lying upon the cuſhion, clap it on, the moment the pencil is gone over the part; and when it is dry poliſh it with a dog's tooth.

How to lay on GOLD *and ſilver.* Set your piece ſlanting, and wet a part with a large pencil dipped in fair water; then, having the Gold ready cut on the cuſhion, lay on the Gold, taking it up with a cotton.

When the whole is gilded, ſet it by to dry, but not either in the wind or ſun, and when it is dry enough burniſh it with a dog's tooth.

To know when it is in a fit temper, paſs the dog's tooth over it in ſome little places; and, if it does not rub kindly, but peels off, it is not dry enough.

But, on the other hand, take care not to let it be too dry; for it will require ſo much the more trouble in poliſhing, and after you have done all you can it will not have the luſtre you deſire.

To lay GOLD *on any thing.* Temper red lead ground fine with linſeed oil, write with it, and lay leaf Gold upon it; let it dry and poliſh it.

To lay GOLD *on glaſs.* Grind together chalk and red lead, each a like quantity, and temper them with linſeed oil; lay it on, and when it is almoſt dry lay leaf gold on it, let it be thoroughly dry, and then poliſh it.

To matt GOLD. Make a red with red lead, a little vermilion, and the white of an egg, well beaten up; grind the whole upon a marble, and clap it into the deep or hollow places with a pencil.

To make ſhell GOLD *and ſhell ſilver.* Grind leaf Gold with honey juſt out of the hive, or very pure, on a clean marble, till it is extremely ſoft under your hand; then put it into a glaſs of fair water, and ſtir it, changing the water till it is very clear and fine.

Then pour into it the quantity of a pennyworth of aqua-fortis, and let it lie for two days; then take out the Gold, and the aqua-fortis may ſerve another time; the ſame may be done with ſilver.

When you would lay on either the one or the other, temper it with one or two drops of a very thin gum water, and, to give it the ſmoother face, let your water be ſoaped.

It will be alſo proper to have a waſh of gall-ſtone under the Gold, which greatly ſets it off.

To dye ſilk a GOLD *colour.* This muſt be dyed after the ſame manner as the ſtraw colour is, only, when it is become reaſonably deep, put it into the laſt ſuds of the orange liquor and ſtir it therein ſo long, till you are ſure it is grown deep enough; then rinſe it out and dry it.

To dye ſtuff a GOLD *colour.* Let the ſtuff be firſt dyed yellow, then ſet freſh water over the fire, and for every pound of ware uſe an ounce of fuſtelwood, called alſo yellow ſhavings, and a good quantity of coarſe pot-aſhes; let the dye boil for half an hour, and afterwards work the ſtuff in it.

GOLD *ſize.* The method of making Gold ſize for burniſhed gilding, or wood, is this: Take a pound and an half of pipe-clay, half an ounce of red chalk, a quarter of an ounce of black lead, forty drops of ſweet oil, and three drachms of pure tallow; grind the clay, chalk, and black lead, all ſeparately, very fine, in water; then mix them all together, add the oil and tallow, and grind all to a due conſiſtence. This is the ſize now in uſe, and is accounted the better, the older it is.

For a golden figure in painting, lay on ſhell Gold and ſhade with gall-ſtone.

HG *Henry* GOLTZIUS. This celebrated Dutch engraver imitated the manner of ſeveral maſters who lived before him. He engraved the paintings of Raphael and other maſters; he uſed this mark.

G. P. ſignifies George Pens.

GRACE *of God*, is repreſented, in painting, by a pretty agreeable damſel all naked, with a very becoming head-dreſs; her golden locks plaited and ſurrounded with ſplendor; holding in both hands a cornucopia, ſhe pours from it many things uſeful, and a ſhining ray round even to the ground.

Her nakedneſs denotes her innocence, that needs no external ornaments; the benefits and good things ſhe diſperſes ſhew, that they all proceed from heaven.

GRACE and greatneſs, in painting. See COMPOSITION.

GRACEFUL *poſture* and proper actions is the ſecond thing in a good picture, that is, that the true and natural motion of every thing be expreſſed in the life and ſpirit of it, that is to quicken the life by art; as in a king to expreſs the greateſt majeſty, by putting or deſigning him in ſuch a graceful poſture that may move ſpectators with reverence in beholding him.

And to draw a ſoldier in ſuch a poſture as may betoken the greateſt courage, boldneſs, and valour; and to repreſent a clown in the moſt aukward and clowniſh poſture; a ſervant or page in the moſt attentive and diligent poſture, &c.

And

And ſo, in all your draughts, the inward affections and diſpoſitions of the mind may be moſt lively expreſſed in the outward action and geſture of the body.

Now, to attain the knowledge of this, you ought moſt diligently to obſerve the works of ſeveral famous maſters, and alſo to follow their examples, who were uſed to delight themſelves in beholding private perſons; as the actions, poſtures, and geſtures of wreſtlers, ſword-fighters, boxers at handy-cuffs, ſtage-players, the alluring glances and geſtures of courtezans, and in malefactors going to execution, to obſerve the contracting of their brows, the motions of their eyes, and the motions of their whole bodies, in order that they might expreſs them to the life in their drawings and works.

Take care likewiſe that you draw with a certain looſeneſs, which is a great excellency in drawing, that is, that the body be not made ſtiff in any part; but that every joint may have its proper bendings, ſo that it may with the greater life expreſs the intention, that the figure may not ſeem lame and the joints ſtiff, as if they were not pliable or capable of bending; but that every joint and limb may have its proper freeneſs and looſeneſs, according as it may beſt ſuit with and become the poſture in which the figure is ſet.

To make a paſte for an oriental GRANATE. The Granate is very like the carbuncle, for, being both expoſed to the ſun, they exhibit the colour of live burning coals, being between red and yellow, which is the true colour of fire.

There are ſeveral ſorts of Granates, both oriental and occidental, ſome deeper, others paler; but the jewellers know how to make them appear, by ſetting them on ſilver foils.

The way to imitate them is as follows:

Take two ounces of natural cryſtal prepared, and ſix ounces of minium, with ſixteen grains of manganeſe of Piedmont, and two grains of zaffer prepared; let the whole be pulveriſed and well mixed together, and being put into a crucible ſet them into the furnace with its cover well luted; there let them bake with the ſame precautions given as to the paſtes for other gems, and you will have a very fine Granate, as reſplendent as the oriental. But the paſte will be yet much fairer, if you take to two ounces of natural cryſtal calcined and prepared ſix ounces of vermilion or minium in fine powder, thirty-five grains of manganeſe of Piedmont prepared, and four grains of prepared zaffer; which, being well pulveriſed, mix together in a crucible, leaving a greater empty ſpace than in the other, by reaſon the matter riſes more than in the others; then lute the cover well, let it dry, and put it in the furnace to bake, as is directed as to other artificial gems, obſerving the ſame circumſtances noted on that ſubject,

ject, and you will have a very fine Granate, fairer thän the reſt.

GRANATUS, the *Garnet*, the name of a very beautiful green, the colour of which is red with a bluiſh caſt; this is a gem very ſubject to faults and blemiſhes, and is of different degrees of colour in its different ſpecimens; and, when perfectly pure and well coloured, it is little inferior to the ruby in beauty.

It is of a middle degree of hardneſs between the ſapphire and common cryſtal, and is found of various ſizes, from that of a large pin's head to an inch in diameter; but ſuch large ones are very rare, the largeſt of theſe uſually found not exceeding a fifth of that ſize; it is almoſt always found oblong, or of an irregularly rounded and pebble-like figure, and never in angular columns; its ſurfaces are never ſo naturally ſmooth and poliſhed as thoſe of the ruby are; and its colour is a ſtrong red which takes in different lights, and never fails to ſhew the bluiſh caſt. Its degree of colour is very different in the different ſpecimens, and it wants much of the brightneſs of the ruby, as well in its poliſhed as in its natural or rough ſtate. Theſe are the determinate characters by which the garnet may be known from all the other red gems among our lapidaries and jewellers. Genuine garnets, according to their different degrees of colour, are known by three different names. 1. The garnet, ſimply ſo called; this is the fineſt and moſt valuable kind, it is of a very deep blood red with a faint admixture of blue. 2. The rock ruby; this is the name they very improperly give to the garnet when it is of a very ſtrong but not deep red, and has a fairer caſt of the blue; this, when pure and perfect, is an extremely elegant gem. 3. The ſorane, or, as they ſpeak it, the ſerain; this is the name by which they call thoſe garnets which are of a yet brighter red, approaching to the colour of native cinnabar, with a faint tinge of blue. 4. The almandine; this is the name given to the garnet, when of the ſame admixture of tinge with what they call the rock ruby, but only a little paler.

Our jewellers very properly diſtinguiſh their garnets into oriental and occidental, for garnets are found both in Europe and in the Eaſt-Indies; the oriental ones are principally from Calicut, Conanor, and Cambay; the European ones are common in Italy, Hungary, and Bohemia; the oriental ones are found looſe among the earth of mountains or ſands of rivers; but the European are moſt frequently found immerſed in vaſt quantities, in ſtrata of browniſh-black ſoft ſtones, interſperſed with ſpangles of talc.

GRAND GUSTO, a term uſed by painters, to expreſs, that there is ſomething in the picture very great and extraordinary, calculated to ſurpriſe, pleaſe, and inſtruct.

Where this is found, they ſay the painter was a man of the

Grand Guſto; and they uſe the words ſublime and marvellous, when they ſpeak of a picture much in the ſame ſenſe.

GJames GRAND *Homme*, engraved the portraits of the hereſiarchs and others, after Rembrant's manner; uſed this mark. At other times he marked thus: J. C. van Uliet.

GRANITE, a ſort of marble, extremely hard, rough, and incapable of taking a thorough poliſh; thus called, becauſe ſprinkled over as it were with a great number of little ſtains, reſembling great grains of ſand.

There are three ſorts of Granites; that of Egypt, that of Italy, and that of Dauphiny.

That of Egypt has browniſh or greeniſh ſpots on a dirty white ground. It is found in very large pieces, and is that chiefly uſed by the Egyptians in their obeliſks and pyramids, or the tombs of their great men. There are columns of this ſtone above forty feet high.

The Granite of Italy is ſofter than that of Egypt, eſpecially in the quarry, where it cuts with much more eaſe.

There is alſo a ſort of green Granite, which is a ſpecies of ſerpentine, ſpotted with green and white ſpots.

The Granite of Dauphiny, a quarry of which has been found, is only a very hard ſort of flint.

GRATEFUL *Remembrance*, is repreſented, in painting, by a young woman of a graceful countenance, crowned with a branch of juniper with berries on it, holding a great nail, and ſtanding between a lion and an eagle.

The juniper never withers, neither does the memory of benefits received; the juniper is ſaid to help the memory; the nail denotes the tenaciouſneſs of memory; the lion and eagle, the remembrance of kindneſs received; the one is a king of beaſts, the other of birds, and are both enemies to ingratitude.

G. R. } ſtands for Guido Rheni of Bologna, a celebrated
G. R. F. } painter.

G. R. B. C. F. ſignifies Guido Rheni, in the overthrow of the giants, engraved by Bartholomew Coriolano.

GREEN, is one of the original colours of the rays of light.

Graſs and herbs, and even all vegetables, in places expoſed to the open air, are Green, and thoſe in ſubterraneous places, or places inacceſſible to the air, white and yellow. Thus, when wheat or the like germinates under ground, it is white or yellow; and what is in the open air, Green; though this too is yellow before it be Green.

Artificial Greens are rarely ſimple colours, but produced by the mixture of yellow and blue.

Two powders, the one blue and the other yellow, well mixed,

appear perfectly Green; though, when viewed with a microſcope, we may obſerve a chequer of blue and yellow.

The dyers make divers ſhades or caſts of Green, as light Green, yellow Green, graſs Green, laurel Green, ſea Green, dark Green, parrot Green, and celaden Green.

All the Greens are firſt dyed in blue, then taken down with wood, verdigreaſe, &c. and then greened with the weed, there being no one ingredient that will give Green alone.

Mountain Green or Hungary Green, is a ſort of greeniſh powder, found in little grains like ſand, among the mountains of Kernanſent in Hungary, and thoſe of Moldavia.

Though ſome are of opinion that this mountain Green is factitious, and the ſame with what the ancients called flos æris, prepared by caſting water, or rather wine, on copper, red-hot from the furnace, and catching the fumes thereof on copper-plates laid over for that purpoſe; or by diſſolving copper-plates in wine, much after the ſame manner as in making verdigreaſe.

Painters make uſe of this colour for a graſs Green.

It is ſometimes counterfeited by grinding verdigreaſe with ceruſs.

Greens are allowed by all perſons to depend upon the yellow and blue, and any Green colour, whatever you pleaſe, may be made with them.

Gamboge is one of the firſt yellows, which may be made to produce five or ſix ſorts of Green with verdigreaſe, according as the gamboge is in the greater or leſſer proportion; if it abounds, it will make a tolerable oak Green, and, being mixed with a greater quantity of verdigreaſe, it will make a fine graſs Green.

But the yellow, which ſome prefer before all others, is made of French berries, which is either deeper or fainter, according as the liquor they are boiled in is more or leſs ſtained by them; if it be very thin, it makes a good glaze all over the verdigreaſe, and, as it approaches nearer to Dutch pink or gall-ſtone, commands almoſt any colour we want; being agreeably mixed with the tranſparent verdigreaſe, and is ſtill tranſparent.

In like manner a yellow, drawn from the roots of barberries, and alſo that drawn from the roots of the mulberry-tree, will, in a great meaſure, produce the like effect, being mixed with the tranſparent verdigreaſe.

As for verdigreaſe itſelf, it produces a fine bluiſh Green, flows readily in the pencil, and may even ſerve as an ink to write with.

For the manner of preparing the tranſparent verdigreaſe, See COLOUR.

Sap GREEN, is a colour like that of an oak-leaf, if it be uſed thin with common water, for this wants no gum; but, if it be uſed ſtrong, will produce as dark a Green as any.

Iris GREEN. The method of making this Green is as follows: Take of the blueſt flower-de-luces, which are called otherwiſe flagiris; ſtrip off the upper or ſattin part of them, and keep only that; the reſt is not good for any uſe in painting, and pick even all the little yellow nerves, and throw them away too; then pound what you have thus picked in a mortar, throwing three or four ſpoonfuls of water upon it, according to the quantity of flowers you pound; but you muſt firſt have diſſolved in this water a little alum, and a very little gum arabic; and, having pounded them well together, ſtrain all through a cloſe cloth, and put this juice into ſhells, which dry in the air.

Pound alum, and, having bruiſed French or Avignon berries, mix them with water, and boil them either over a fire or an aſh-heat, till the water becomes very yellow; then pound the flower-de-luces in a mortar, and pour a little of this yellow water upon them, according as you would have your Green, either bright or ſad; then ſtrain it through a cloth of goat's hair, for, if it were paſſed through linen, it would not be ſo good; and put the juice ſo ſtrained into large ſhells, and expoſe them to all the heat of the ſun; for, if they are ſet in the ſhade, the Green will become mouldy, or mothery, and prove too clammy.

To make bladder GREEN. Pound the berries of the bramble called rhamnus, in a mortar, and ſprinkle upon them a little powdered alum; then preſs or ſqueeſe out the juice, and put it up in a bladder, which tie cloſe, and leave it to dry till the Green is grown hard.

GREEN, for tincturing and painting on glaſs. See GLASS.

GREEN, *to dye.*

I. *To dye an olive* GREEN. Take clear bran liquors, but ſtale, a ſufficient quantity, alum three pounds, logwood ground one pound; boil, and enter twenty yards of broad-cloth; boil two hours and an half, cool, and waſh it well. Take clear water a ſufficient quantity, heddar, commonly called linge, heath ſtravel, or fuſtic, as much as may make twenty yards of broad-cloth Green; then take water a ſufficient quantity, fuſtic a pound; cruſt madder, nut-galls, ſumach, of each four ounces; boil, enter your cloth, handle it well; boil it an hour and a half, and ſo cool; add copperas four ounces, and enter your cloth again; boil half an hour; if you would have it ſadder, put in more copperas.

II. *To dye a popinjay* GREEN. Take water a ſufficient quantity, alum, two pounds; logwood ground, eight ounces; boil, and enter twenty yards of broad-cloth; boil three hours, and make it a bright yellow; then draw it through a cold vat, and then waſh it.

III. *To dye a ſea* GREEN. Firſt make it a ſad blue, then take

water, a ſufficient quantity; alum, two pounds; logwood, four ounces; boil, and enter your cloth; boil three hours; then waſh it, and make it a bright yellow; after which, draw it through a cold vat; then waſh it again.

IV. *To dye a French* GREEN. Take clear ſtale bran liquor, a ſufficient quantity; alum, two pounds and a half; boil, enter twenty yards of ſad blue broad-cloth; boil it two hours and a half, and waſh it well. Take water a ſufficient quantity, heath ſtravel, or fuſtic, ſufficient; boil well, put in your cloth, and handle it well; then take twenty ounces of logwood ground, and put into the dye alſo copperas four ounces, which binds the colour; and, if you pleaſe, you may new-draw the cloth through a new vat, and handle it; ſo will it be finiſhed.

V. *To dye a verdigreaſe* GREEN. Take water, a ſufficient quantity; make it as hot as you can endure your hand in it, in which put verdigreaſe, two ounces, in fine powder; enter twenty yards of ſtuff, and handle it well with your hands; let it lie in the liquor all night, ſtirring it ſome time, and then let it lie till it is deep enough.

VI. *To dye a popinjay* GREEN. Take clear ſtale bran liquor or ſour tap-wort a ſufficient quantity, alum three ounces; boil, and enter twenty yards of broad-cloth, and boil three hours; cool your cloth and waſh it well. Take fair water a ſufficient quantity; neddar, called alſo linge, or heath ſtravel, a good quantity; boil it well, and take it out; then enter your cloth; boil it well, making it a bright yellow. Heat your blue vat, and put in indigo bruiſed ſmall, four ounces; madder, three ounces; ground malt, two quarts; new yeaſt, a quart; mix theſe things well together, keep them as hot as you can, and let it ſtand till it will ſtrike blue; then enter your cloth, and handle it well, to avoid ſpotting, till it is done, and ſo waſh it.

VII. *To dye a foreſt* GREEN. Firſt, make your cloth a good blue. Take clear ſtale bran liquor, a ſufficient quantity; alum, three pounds; logwood ground, five ounces; let them boil, enter twenty yards of broad-cloth, handle, and boil it two hours and a half; take it out, cool, and waſh it. Take fair water, a ſufficient quantity; and good hedder, enough to make your cloth Green; boil it well, then enter your cloth, and boil a ſufficient time. Take fair water, a ſufficient quantity; logwood ground, twenty ounces; boil them a quarter of an hour, cool a little; then enter your cloth, and handle it well, letting it boil about a quarter of an hour longer; after which, cool your cloth, and waſh it well.

VIII. *To dye a graſs* GREEN. Firſt, make your cloth a bright blue, then take clear ſtale bran liquor or ſour tap-wort, a ſufficient quantity; alum, three pounds; let them boil, and enter

twenty yards of broad-cloth; handle it, boil with a ſtrong fire for two hours, cool, waſh it well. Take water, a ſufficient quantity; hedder or heath ſtravel, what you think fit; boil well for an hour; take forth the hedder, enter your cloth, handle it well, and let it boil a quarter of an hour; then cool, and put in a little urine; enter your cloth again, boil a quarter of an hour, cool, and waſh it well.

Note, That the different and various colours of Greens ariſe from the firſt blue being lighter or ſadder, or from the yellow being a deep or light colour.

To dye woollen ſtuffs GREEN. Firſt, dye the ſtuffs yellow with broom or dye-weed, rinſe them well out, and while they are yet wet paſs them through the blue dye, and work it, till it is the colour you would have it, either light or dark; ſo that ſeveral ſhades or ſorts of Green may be dyed the ſame way, the ſtuffs having been always firſt tinged yellow.

A ſea GREEN. For every pound of ſtuffs allow three ounces of verdigreaſe powdered, three pints and a half of wine vinegar, ſtir the verdigreaſe in it; paſs a pair of ſtockings through the liquor, and then hang them out without rinſing; when they are dry, wet them in the liquor again, and hang them up to dry again, ſo often, till they are perfectly cleared from all humidity.

A brown or iron GREEN. Having hung clear rain water over the fire, put in, for every pound of woollen, powdered galls, gum, braſil, and copperas, of each an ounce and an half, and verdigreaſe, one ounce; boil them well together, ſtirring them very well; then boil the ſtuffs in it, till it is to your mind, and when it is cold rinſe it out.

To dye a laſting brown or iron GREEN. For a piece of ſtuff of fifteen ells take three quarters of a pound of alum, half a pound of tartar, two ounces of calcined vitriol; in theſe boil the ſtuff for half an hour, then rinſe it in clean water; and when it is dried for the blue you may throw away the alum ſuds.

How to blue it. The ware being blued with woad of a light or deep brown according to your mind, then rinſe it again, dry it and prepare it for the following yellow. Boil eight pounds of broom for half an hour, keeping it down in the kettle with a ſtick, &c. that it does not float on the top of the water; and, when you uſe it, add to it two quarts of ſharp ley, half an ounce of flower of brimſtone, and an ounce of verdigreaſe; then dye the goods but only once, and it will be of a beautiful brown or iron Green.

If you pleaſe, you may dye the ſtuff Green from a lead colour, and it will be deeper than the former, and laſt very well; but, when it is dyed with brown wood and blued, it will be lighter, but not ſo firm as the other.

To dye linen GREEN. Lay the linen a whole night in ſtrong alum water, dry it well, then boil broom or dyers-weed, for the ſpace of an hour; take it out, and put into the ſuds either half or a whole ounce of verdigreaſe, according to the quantity of the ware you have to dye; ſtir it well about with a ſtick, and then work the linen in it once, twice, or thrice, as occaſion requires, adding, the ſecond and third time, a quantity of pot-aſhes equal to an hen's egg; then work your linen the third time, and you will find it of a yellow colour; then dry it in the air, and afterwards throw it into the blue vat (ſee BLUE) and that will produce the Green you deſire.

To dye thread of a laſting GREEN. Boil three quarters of a pound of alum, half a pound of tartar, in two quarts of ſharp ley for an hour, and in it ſoak the thread for three hours, keeping it hot all the while.

Then dye it yellow. Put into the kettle eight pounds of broom, one pound of corn marigold flowers, half a pound of crab-tree bark, that looks yellow and ripe; and ſuperadd two quarts of ſharp ley; when theſe have boiled half an hour, then dye the thread in the liquor as deep a yellow as poſſible; but if you can procure Spaniſh yellow, an addition of three quarters of a pound of it will heighten the dye, and render it more laſting; for it is to be remembered, that all yellows that are deſigned to be dyed Green, muſt be as deep as poſſibly they can be.

After this turn it GREEN *with blue dye.* There are in this, as in the foregoing receipt, four operations in dying a good Green, that you may make it either a light or a dark Green at pleaſure: For, firſt,

You may blue the thread with woad, or elſe with indigo, being firſt thrown into the alum ſuds, and afterwards into the yellow, and you will have a laſting Green. So that Green is to be dyed ſeveral ways.

Another GREEN *for thread.* Firſt fill the kettle with ſharp ley, and then throw in a bundle of broom; boil them very well, and then pour off the liquor into a vat, and for every pound and an half of thread allow half an ounce of verdigreaſe, and half an ounce of alum; put theſe into a quart of ley, in which brown braſil wood has been boiled; ſtir them together, and pour them into the broom water; and, in this mixed liquor, lay the thread in ſoak for one night, and you will find it well dyed.

GREENS *for ſilks.* For every pound of ſilk take a quarter of a pound of Engliſh alum, two ounces of white-wine tartar beaten ſmall; diſſolve them together in hot water, then put in the ſilk, letting it lie a whole night; then take it out and dry it; having done this, take a pound of broom, boil it in a pail and an half of water for an hour or better; then take out the broom and throw

it away, and put in half an ounce of beaten verdigreaſe, ſtirring it about with a ſtick; then put in the ſilk for a quarter of an hour, take it out and let it lie till it is cold; then put in one ounce of pot-aſhes, ſtir them about and put in the ſilk again, keep it there till you think it is yellow enough, then rinſe it out and let it dry; after which put it into the blue dye vat or copper, and let it remain there till it becomes Green and dark enough; then take it out and you will have a good Green, to be beaten and dried.

You may let it lie a longer or leſs while in the dye, according as you would have the Green lighter or darker; for at firſt you will have but a faint Green.

Graſs GREEN. Firſt dye your ſilk a pretty deep ſtraw colour, rinſe it clean and wring it cloſe together with ſticks; and then put about fifteen or twenty handfuls of ſkains into the blue dye copper; though you muſt take care that the ſtrength of the dye be proportioned to the quantity of ſilk, and that you do not put in too many ſkains at once.

When it has boiled enough take the kettle off, and let it ſtand for an hour; after which time you may work it again, and do the ſame every hour, allowing the ſame interval; but you muſt be very careful that one handful does not lie longer in than another, and, when it is taken out of the copper, let it be very well cooled, rinſed, and ſtrongly wrung with ſticks, and afterwards dried.

To dye a parrot or parroquet GREEN. This, being ſomething lighter than the other, muſt be boiled in weaker ſuds than the other, and, as ſoon as it it dyed, muſt be wrung and dried as the other.

To dye Green finch or canary bird GREEN. This muſt be dyed as the Green; but you ought to add a little Provence wood to the laſt ſuds, according to the quantity of the ſilk; after which it muſt be boiled in the blue copper, wrung out, and rinſed.

To dye olive GREEN. This alſo muſt be dyed as the Green, only the laſt ſuds muſt be encouraged with a little Provence wood ſuds, till it is deep enough; then wring it out, &c. as above.

To dye a celadon or celandine GREEN. This colour, being very light and bright, muſt be dyed as the ſea Green, and boiled in weak ſuds, and managed as the Green, and dried.

To dye a ſea GREEN. For every pound of ſilk take three ounces of verdigreaſe pounded ſmall, put it into good wine or ſharp vinegar to diſſolve; let it lie a whole night in it, in the morning ſet it over the fire and make it hot, ſtirring it about with a ſtick; and then put in the ſilk, but take care not to let it boil; and let it remain two hours, or one, or half an hour, according

as

as you would have the colour a deep, middling, or light Green; then put ſome boiling hot water into a vat or tub, to which add half an ounce or an ounce of ſoap, and make a lather; when it froths it is ready; then hand the ſilks in it, let them drop afterwards, and rinſe them in river water, beat them very well, and dry them.

John GREENHILL, was a gentleman deſcended from a good family in Saliſbury, where he was born; he was diſciple to Sir Peter Lely, whoſe manner in a ſhort time he ſucceſsfully imitated, and became a great proficient in crayon draught as he afterwards did in painting; he failed very little of his maſter's excellencies, who firſt neglected, and then became jealous of him as a dangerous rival; for he never let him ſee him paint but once, and that was by ſtratagem. Mr. Greenhill had long had a deſire to ſee Sir Peter manage his pencil, but ſo ſhy was that great artiſt of revealing his myſtery, that he would never lend him the leaſt aſſiſtance all the while he was with him; which made Mr. Greenhill, after he had left him, have recourſe to a wile to procure that which he muſt have otherwiſe deſpaired of. He procured Sir Peter to paint his wife's picture, through which means he had an opportunity to ſtand behind and ſee what he did; which being greatly to his ſatisfaction on a double account, he made his maſter a preſent of twelve broad pieces, and ſo took the picture away with him, having thus obtained his end; he, in a little time, became exceeding famous for face-painting; inſomuch, that, had he not died young, England might have boaſted of a painter, who, according to his beginnings, could not have been much inferior to the very beſt of foreigners.

GRENAILLE, a name given, by the French writers, to a preparation of copper which the Chineſe uſe, as a red colour in ſome of their fineſt China, particularly for that colour which is called oil red or red in oil. The China ware, coloured with this, is very dear; the manner in which they procure the preparation is thus: They have in China no ſuch thing as ſilver coined money, but they uſe, in commerce, bars or maſſes of ſilver; theſe they pay and receive in large bargains, and, among a nation ſo full of fraud as the Chineſe, it is no wonder that they are often adulterated with too great an alloy of copper; they paſs however in this ſtate in the common payments. There are ſome occaſions, however, ſuch as the paying of the taxes and contributions, on which they muſt have their ſilver pure and fine. On this occaſion they have recourſe to certain people, whoſe ſole buſineſs it is to refine the ſilver and ſeparate it from the copper and lead it contains; this they do in furnaces made for the purpoſe, and with very convenient veſſels. While the copper is in fuſion, they take a ſmall bruſh and dip the end of it into water; then, ſtriking the

handle

handle of the bruſh, they ſprinkle the water by degrees upon the melted copper. A ſort of pellicle forms itſelf by this means on the ſurface of the water, which they take off while hot with pincers of iron, and, immediately throwing it into a large veſſel of cold water, it forms that red powder which is called Grenaille; they repeat the operation every time; they in this manner ſeparate the copper, and this furniſhes them with as much of the Grenaille as they have occaſion for in their China works.

GREY, *to dye.*

1. *Silver grey colour.* Take water, a ſufficient quantity; of nut-galls bruiſed ſmall, two ounces; tartar bruiſed, three ounces; boil them, enter twenty yards of ſtuff or cloth, &c. handle and boil an hour and an half, cool it; then put in copperas, a ſufficient quantity; enter your cloth again at a boiling heat, handle it, boil a quarter of an hour, and ſo cool; if you would have it ſadder, put in more copperas.

2. *To dye a light* GREY *colour.* Take water, a ſufficient quantity, nut-galls bruiſed ſmall, four ounces; white tartar bruiſed ſmall four ounces, make them boil; then enter twenty yards of broad cloth, and handle it, boiling an hour and an half, cool your cloth, and put in copperas, an ounce and an half; enter your cloth again and handle it, boil it a quarter of an hour, and cool it; if you would have it ſadder, put in more copperas.

3. *To dye a dark* GREY. For every pound of woollen ware, uſe a quarter of a pound of copperas and a quarter of a pound of brown wood, or walnut-tree wood.

To finiſh it. Take two ounces of brown wood, and half an ounce of copperas.

A ſilver GREY. Boil the goods with two ounces of alum, and two ounces of pot-aſhes, for every two pounds of woollen; which let lie in it one whole night, and then boil it.

Then to finiſh it. Diſſolve two ounces of ſal armoniac, two ounces of litharge of ſilver, two ounces of bright ſoot, a drachm of cryſtal of tartar, together for one night; boil them an hour, and paſs the woollen ſtuffs through it.

To dye ſtuffs, &c. a lavender GREY. Heat a proper quantity of clean rain water in a kettle, and, for every pound of ſtuff, take an ounce of blue lac beaten ſmall, and half an ounce of pounded galls, and the ſame quantity of vitriol; boil them together, and put in the ſtuffs, and boil them for half an hour.

This dye is proper for ſlight ware, as ſtockings and coarſe ſtuffs; but not for the better ſort.

To dye ſilk a good GREY. This you may prepare as the tawny dye, and after you have wrung out, rinſed, and beaten it, if it be browned, it becomes a good Grey.

GRIEF, is repreſented, in painting, by a man naked, manacles

nacles upon his hands, and fetters on his feet, encompaſſed with a ſerpent gnawing his left ſide, and he ſeeming to be very melancholy.—The fetters denote the intellects, that diſcourſe and produce irregular effects, being ſtreightened by perplexity, and cannot attend to their accuſtomed operations; the ſerpent ſignifies misfortunes and evils, which occaſion deſtruction, which is the chief cauſe of Grief.

GRINDING glaſs, for looking-glaſſes, &c. is performed after the following manner:

In the new method of working large plates of glaſs, for looking-glaſſes, &c. by moulding, and as it were caſting them ſomewhat after the manner of metals, that you will find under the article GLASS. The ſurface being left rough, it remains to be ground and poliſhed.

In order to this, the plate of glaſs is laid horizontally on a large ſtone, in the manner of a table, and, to ſecure it the better, plaiſtered down with plaiſter of Paris, &c. that the effort of the workman, or of the machine uſed in Grinding, may not diſplace or looſen it: This ſtone table is ſuſtained by a wooden frame. The bottom or baſe of the Grinding machine is another rough glaſs, about half the ſize of the glaſs deſigned principally to be ground; on this upper glaſs is a plank of wood, cemented to it, and upon this are ſet weights, to promote the triture or wearing of the ſurface of the rough caſt glaſs.

This table or plank is ſometimes faſtened to a wheel, which gives it a motion.

This wheel, which is at leaſt five or ſix inches in diameter, is made of a very hard but light wood, and is wrought by two workmen, placed againſt each other, who puſh and pull it alternately; and ſometimes, when the work requires it, turn it round.

By ſuch means, a conſtant mutual attrition is produced between the two glaſſes, which is aſſiſted by water and ſands of ſeveral kinds, which are cauſed to paſs between them; ſand being applied ſtill finer and finer, as the Grinding advances, till at laſt emery is uſed.

As the upper or incumbent glaſs poliſhes and grows ſmooth, it is ſhifted from time to time, and others put in its place.

But only the largeſt-ſize glaſſes are thus wrought with a wheel or machine; the middling and ſmaller ſorts being wrought by the hand.

GROSSNESS, is repreſented, in painting, by a groſs corpulent woman, holding an olive branch in her right hand bearing fruit without leaves; in her left a crab.—The olive branch denotes fatneſs; the crab, as much ſubject to fatneſs while the moon increaſes, either from the particular quality of the moon,

moon, or elſe becauſe, when it is full moon, the crab has by the light a fairer opportunity to procure its food.

GROUNDS *for a limning or painting after the life.* The Ground behind a picture in miniature, &c. is commonly blue or crimſon, imitating a curtain of ſattin or velvet; if it be to be blue, you muſt lay it on as follows, viz. waſh bice till it is very pure and clear, temper a quantity in a ſhell, ſufficient for your Ground, and let it be thoroughly moiſt, and well bound with gum. Then with a ſmall pencil go about, with the ſame colour, the pourfile, i. e. the utmoſt ſtroke, and ambient ſuperficies of the picture; having done this, take a larger pencil, and therewith waſh over, ſomething carefully, the whole Ground that you deſign to cover with a blue, ſomewhat thin and wateriſh; and then, with a pretty large pencil, full of colour and flowing, lay over that place with a thick and ſubſtantial body of colour, which you had only waſhed over before; in the doing of this you muſt be very quick, keeping the colour moiſt that you have laid, not ſuffering any part to dry till you have covered the whole.

If you would have your Ground a crimſon, like ſattin, then trace out where and in what places you would have theſe ſtrong and hard lights and reflections to fall, which are ſeen in ſattin or velvet, with Indian lake; there lay your lights with a lake that is thin and wateriſh, and, while it is yet wet, lay the deepening and hard ſtrong ſhadows with a ſtronger and darker colour of lake thick ground, cloſe by the other lights. The beſt way for imitation is to have a piece of ſattin before you to imitate.

GROUP, in painting and ſculpture, is an aſſemblage or knot of two or more figures, of men, beaſts, fruits, or the like, which have ſome apparent relation to each other.

In a good painting it is neceſſary, that all the figures be divided into two or three Groups or ſeparate collections.

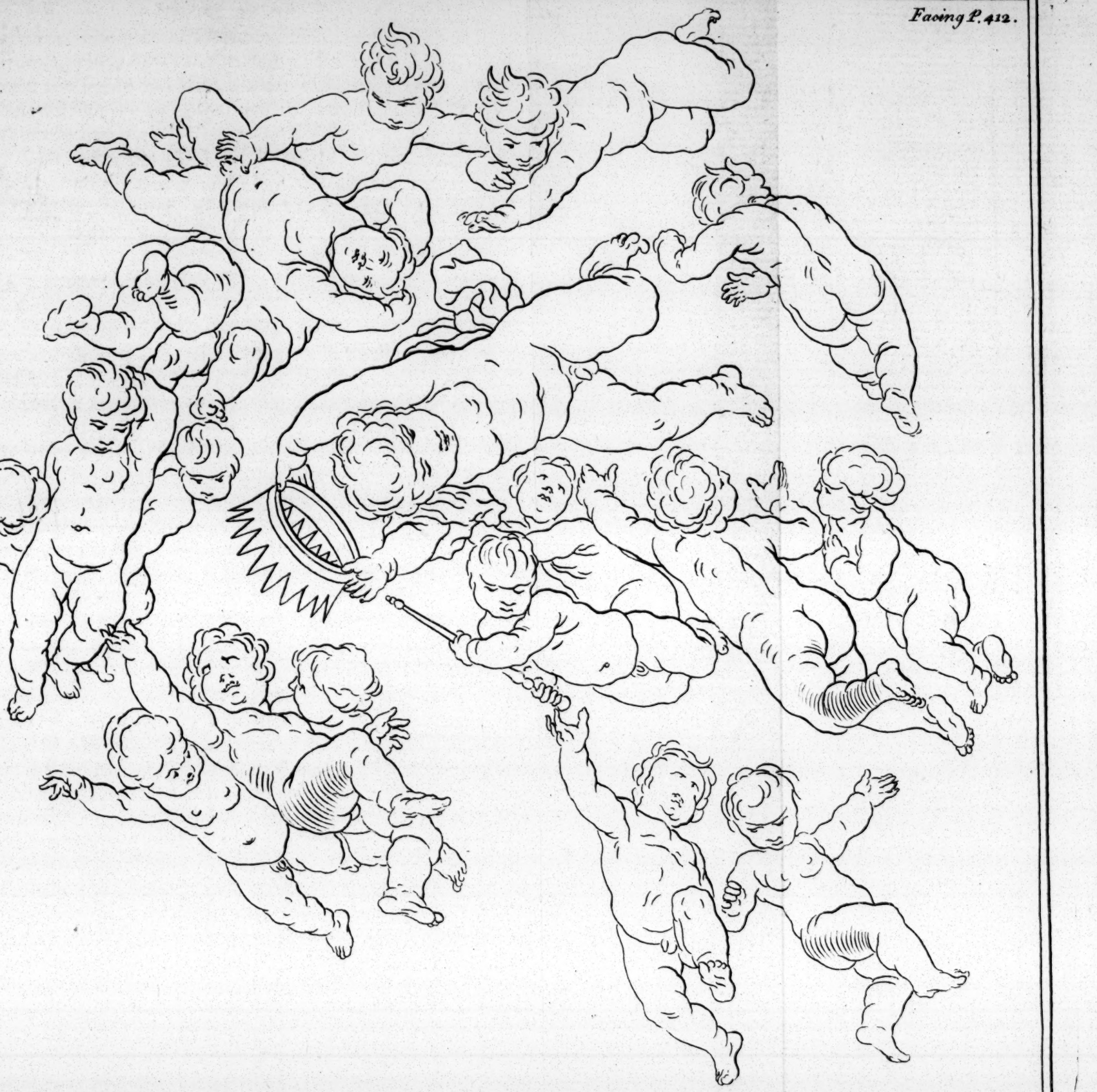
Thus, they ſay, ſuch a thing makes a Group, with ſuch and ſuch others, of a different nature and kind.

A Group has ſomething in it of the nature of a ſymphony or concert of voices; as in the one the voices muſt ſuſtain each other, in order to fill the ear with an agreeable harmony from the whole, whence, if any part were to ceaſe, ſomething would neceſſarily be miſſed; ſo, in Groups, if the parts or figures be not well balanced, ſomething will be found diſagreeable.

There are two kinds of Groups, or two manners of conſidering Groups; with reſpect to the deſign, and to the clair-obſcure: The firſt is common both to works of painting and thoſe of ſculpture.

Groups, with reſpect to the deſign, are combinations of divers figures, which bear a relation to each other, either upon the account of the action, or of their proximity, or of the effect they have.

Facing P. 412.



have. Theſe we conceive, in ſome meaſure as repreſenting ſo many different ſubjects, or, at leaſt, ſo many diſtinct parts or members of one greater ſubject.

Groups, with reſpect to the clair-obſcure, are bodies of figures, wherein the lights and ſhadows are diffuſed in ſuch a manner, that they ſtrike the eye together, and naturally lead it to conſider them in one view. See plate XXII.



Matthew GRUNEWALD, ſirnamed of *Aſchaffemberg*, painter and engraver, after the manner of Albert Durer, uſed this mark. He lived in the year 1510.



Leonard GUALTIER, uſed this mark.

G. S. F. ſtands for Gio or John Sirani fecit.

GUIL. *Baurn*, 164. ſtands for William Baur, painter to the emperor.

GUM, a vegetable juice, that exſudes through the pores of certain plants, and there hardening into a tenacious tranſparent maſs. See each under its proper article.

GUM *reſin*, is a hardened juice of a middle reſin; being both diſſoluble in aqueous menſtruums like a Gum, and in oily ones like a reſin.

Such are maſtic, camphire, ſtorax, &c.

G. V. S. G. ſignifies, Van Scheendel, fecit, and V. V. Buytuvech, invenit.

H.

HAIR, to paint, in miniature, lay on biſtre, oker, white, and a little vermilion; but, when it is dark, you muſt uſe black inſtead of oker; and then ſhade with the ſame mixture, diminiſhing from the white, and finiſh with the biſtre alone, or mixed with oker or black, by fine thin ſtrokes, very near to each other, waving and curling them according to the turn of the Hair.

You muſt alſo refreſh the lights with fine turns of oker or orpiment, or white and a little vermilion; after which, blend away the lights into the ſhades, working ſometimes with brown, ſometimes with pale.

As for the Hairs upon and round the forehead, through which the fleſh is ſeen, they muſt be coloured with the colour of fleſh, ſhading and working beneath, as if you deſigned there ſhould be none; then ſhape them and finiſh them with biſtre, and refreſh the lights as you did the reſt.

HAIR, of women and children, is coloured with ſimple brown oker, and heightened with maſticote; the ſame in the Hair of men, only making it ſadder or lighter as the life requires.

Hair, which is black, may be coloured with ſoot or lamp-black, but it will abide no heightening.

Children's Hair is ſometimes laid with brown oker and white, and heightened with the ſame, and ſometimes with alum.

Sometimes alſo it is done with light oker, and deepened with brown oker, and heightened with maſticote ſimple.

Old womens Hair is coloured with brown oker and black, heightened with brown oker and white.

Grey HAIRS, are coloured with white, black, and biſtre; and finiſhed with the ſame mixture, but ſtronger, heightening the lights with a very pale blue and white.

But the matter of the greateſt importance is to ſoften the work, to run the tints into one another, as well as the Hair on and about the face into the fleſh, taking eſpecial care that you work not dry or hard, and that the outlines of the fleſh be not cut.

You muſt accuſtom yourſelf to mix with white, but juſt as you want more or leſs of it; for the ſecond colouring muſt be always a little deeper than your firſt, except it be for ſoftening.

The various colourings may be eaſily produced, by taking more or leſs red, blue, yellow, or biſtre, whether for the firſt colouring or for finiſhing.

The colouring for women ſhould be bluiſh, for children a little red, both freſh and gay; and for the men it ſhould incline to yellow.

Of dying HAIR *colours.*

1. *To dye* HAIR *colours.* Take water a ſufficient quantity, alum three pounds, with which alum twenty yards of broad-cloth; and after which make it of a bright yellow with fuſtic. Then take water a ſufficient quantity, nut-galls in powder two pounds, madder in powder four ounces; let it boil an hour, then take it out and cool it; after which put in copperas eight ounces, making it boil; put in your cloth, handle it well about a quarter of an hour; take it out and cool it, if it is not ſad enough; put it in again, for, the oftener you take it out and put it in, the ſadder it will be.

2. *Another* HAIR *colour.* Take water a ſufficient quantity, alum three pounds; enter twenty yards of broad-cloth, boil it three hours; take it out and waſh it well, and make it a bright yellow. Take nut-galls eight ounces, madder four ounces made ſmall, put them into your cauldron, and let them boil; enter your cloth and handle it well; boil it one hour, then take it out and cool it; add to the former things copperas eight ounces; let it boil,

boil, put in your cloth again, handle it well, and repeat this work till it is ſad enough.

3. *A* HAIR *or cloth colour.* Take water a ſufficient quantity, cruſt madder, nut-galls, ſumach, red wood ground, of each a pound; boil them, and enter twenty yards of broad-cloth; boil an hour, ſadden with copperas ſix ounces.

Another HAIR *colour.* Take water a ſufficient quantity, nut-galls eight ounces, fuſtic one pound, madder four ounces, red wood two ounces; make them boil, enter twenty yards of ſtuff, &c. and boil it two hours; cool your cloth, and put in copperas four ounces; enter your cloth again, handle and boil it a quarter of an hour, then cool it; put in more copperas, if you would have it ſadder.

HANDLING. By this term is underſtood the manner in which the colours are left by the pencil upon the picture; as the manner of uſing the pen, chalk, or pencil in a drawing, is the Handling of that drawing.

This, conſidered in itſelf abſtractedly, is only a piece of mechanics, and is well or ill, as it is performed with a curious, expert, or heavy, clumſy hand; and that whether it is ſmooth or rough, or however it is done; for all the manners of working the pencil may be well or ill in their kind, and a fine light hand is ſeen as much in a rough, as in a ſmooth manner.

It is delightful to ſee a freedom and delicacy of hand in painting, as in any other piece of work; it has its merit. Though, to ſay a picture is juſtly imagined, well diſpoſed, truly drawn, is great, has grace, or the other good qualities of a picture, and withal that it is finely handled, is as if one ſhould ſay a man is virtuous, wiſe, good-natured, valiant, or the like, and is alſo handſome.

But the Handling may be ſuch as to be not only good, abſtractedly conſidered, but as being proper, and adding a real advantage to the picture; and then to ſay a picture has ſuch and ſuch good properties, and is alſo well handled, in that ſenſe, is as to ſay, a man is wiſe, virtuous, and the like, and is alſo handſome, and perfectly well bred.

Generally, if the character of the picture is greatneſs, terrible, or ſavage, as battles, robberies, witchcrafts, apparitions, or even the portraits of men of ſuch characters, there ought to be employed a rough bold pencil; on the contrary, if the character is grace, beauty, love, innocence, &c. a ſofter pencil, and more finiſhing is proper.

It is no objection againſt a ſketch if it be left unfiniſhed, and with bold rough touches, though it be little, and to be ſeen near, and whatſoever its character be; for thus it anſwers its end, and the painter would, after that, be imprudent to ſpend more time

time upon it. But generally ſmall pictures ſhould be well wrought.

Jewels, gold, ſilver, and whatſoever has a ſmart brightneſs, require bold rough touches of the pencil in the heightenings.

The pencil ſhould be left pretty much in linen, ſilks, and whatſoever has a gloſſineſs.

All large pictures, and whatſoever is ſeen at a great diſtance, ſhould be rough; for, beſides that it would be a loſs of time to a painter to finiſh ſuch things highly, ſince diſtance would hide all that pains, thoſe bold roughneſſes give the work a greater force, and keep the tints diſtinct.

The more remote any thing is ſuppoſed to be, the leſs finiſhing it ought to have. I have ſeen a fringe to a curtain in the back ground of a picture, which perhaps was half a day in painting, but might have been better done in a minute.

There is often a ſpirit and beauty in a quick, or perhaps an accidental management of the chalk, pen, pencil, or bruſh, in a drawing or painting, which it is impoſſible to preſerve if it be more finiſhed, at leaſt it is great odds but it will be loſt; it is better therefore to incur the cenſure of the injudicious, than to hazard the loſing ſuch advantages to the picture. Apelles, comparing himſelf with Protogenes, ſaid, Perhaps he is equal, if not ſuperior to me in ſome things, but I am ſure I excel him in this; I know when to have done.

Fleſh, in pictures, to be ſeen at a common diſtance, and eſpecially portraits, ſhould, generally ſpeaking, be well wrought up, and then touched upon every-where in the principal lights and ſhadows, and to pronounce the features; and this more or leſs, according to the ſex, age, or character of the perſon, avoiding narrow or long continued ſtrokes, as in the eye-lids, mouth, &c. and too many ſharp ones; this, being done by a light hand, judiciouſly gives a ſpirit, and retains the ſoftneſs of fleſh.

In ſhort, the painter ſhould conſider what manner of Handling will beſt conduce to the end he propoſes; the imitation of nature, or the expreſſing thoſe raiſed ideas he has conceived of poſſible perfection in nature, and that he ought to turn his pencil to; always remembering that what is ſooneſt done is beſt, if it is equally good upon all other accounts.

There are two miſtakes very common; one is, becauſe a great many good pictures are very rough painted, people fancy that it is a good picture that is ſo: There is bold painting, but there is alſo impudent painting. Others, on the contrary, judge of a picture, not by their eyes, but by their fingers ends; they feel if it be good.

Thoſe appear to know little of the true beauties of the art, that thus fix upon the leaſt conſiderable circumſtance of it, as if it were all, or the principal thing to be conſidered.

The

The cartoons, as they are properly no other than coloured drawings, are handled accordingly, and extremely well. The fleſh is generally pretty much finiſhed, and then finely touched upon. There is much hatching with the point of a large pencil upon a prepared ground: The hair is made with ſuch a pencil, for the moſt part.

Leonardo da Vinci had a wonderous delicacy of hand in finiſhing highly; but Giorgion and Correggio have eſpecially been famous for a fine, that is a light, eaſy, and delicate pencil. You ſee a free bold Handling in the works of Titian, Paolo Veroneſe, Tintoretto, Rubens, the Borgogne, Salvator Roſa, &c. Malteſe had a very particular manner; he painted chiefly Turkey-worked carpets, and left the pencil as rough as the carpet itſelf, and admirably well in its kind. For works at a great diſtance, Lanfranc had a noble manner of Handling; as particularly in the cupola of St. Andrea della Valle, which is in freſco, and where the colours are flung on with a ſponge inſtead of a pencil or a bruſh, not for a whim, but as moſt proper to the purpoſe; and an eye, for example, appears near, as one rude ſpot, but as it ought at its intended diſtance.

Perhaps no man ever managed a pencil in all the ſeveral manners better than Van Dyke.

Of drawing HANDS *and feet.* It requires ſome time to practiſe drawing of Hands and feet, before you proceed to the drawing of whole bodies; becauſe it will be too difficult to enter upon them, till you have been pretty well practiſed in the drawing the ſeveral limbs and parts of them, eſpecially the Hands and feet, which are the moſt difficult parts of the body to draw, next to the face; and by practiſing of theſe you will be able more readily and eaſily to attain the leſs.

And it is certainly moſt commendable exactly to draw a Hand, which hath ſo many varieties of poſture and action, which will be found very difficult to imitate in every one of them, in the ſpirit and life of them, without ſome lameneſs or imperfection.

The actions and poſtures of the Hand are ſo various, that no certain rule can be given for the drawing them; but you may take this for a general rule, that, when you firſt draw it with charcoal, you are not to draw it perfectly, that is to ſay, to make all the joints, or veins, or other things to appear, but either lightly or faintly; to touch out the bigneſs of the Hand, and the manner of turning it, with faint touches, and not with hard ſtrokes; and, when you have done that as it ſhould be, part the fingers aſunder or cloſe, according to your pattern, with the like faint ſtroke; then mark that place where any of the fingers ſtand out from others, and make a faint reſemblance of it.

When you have done this, if you find your draught to be

right, proceed to draw it more perfectly; and make the bending of the joints, the wriſt-bone, and other principal parts more exactly.

Then, in the laſt place, go over it again, and draw every ſmall bending or ſwelling of the fingers, and make the nails, knuckles, and veins, ſo many of them as appear, and every thing elſe that you can diſcern.

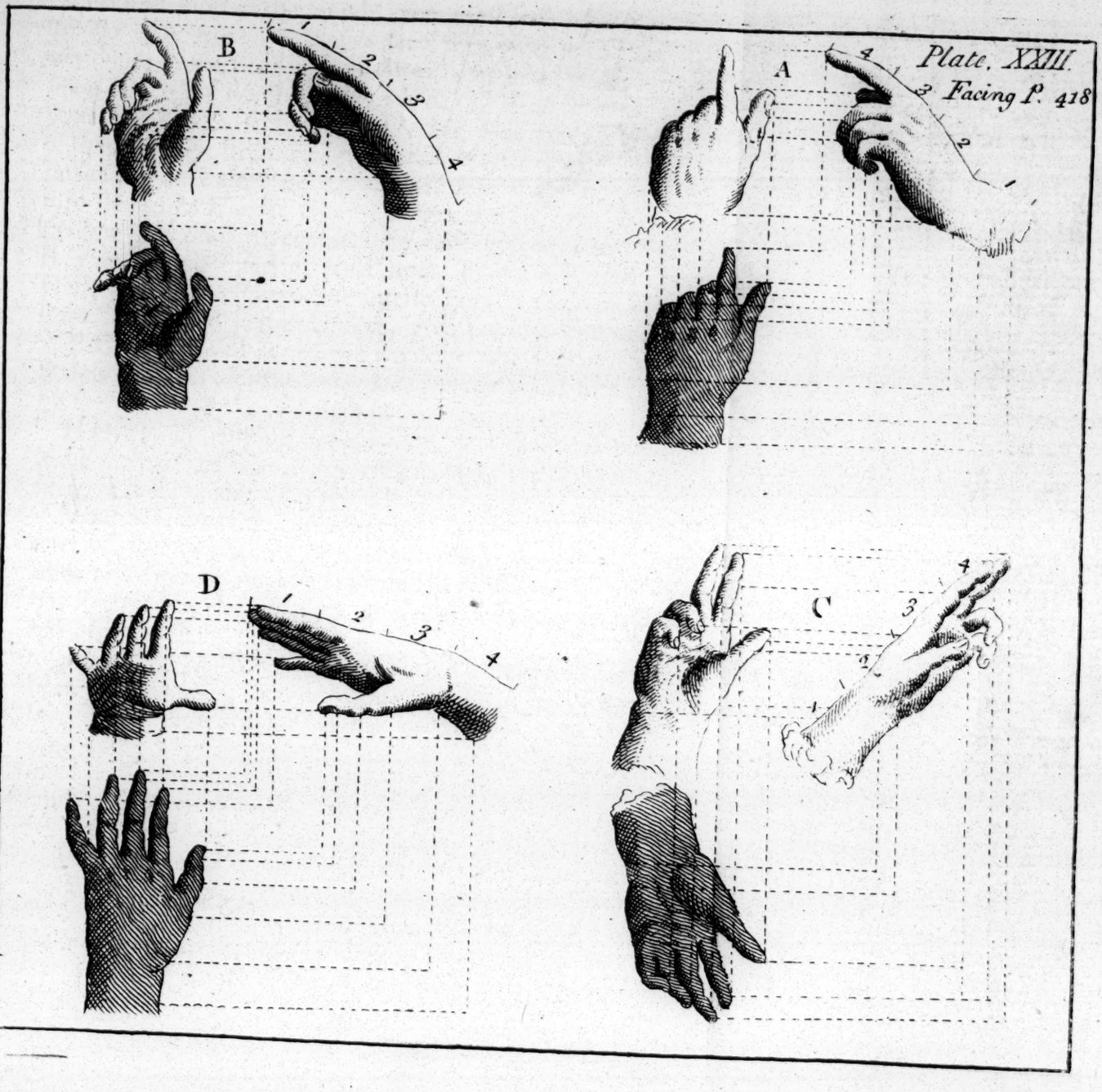
Obſerve this rule in all your drawings, that, before you ſet about drawing your draught with black lead or other things, you muſt blow off the looſe duſt of the coal from your drawing, or faintly whiſk over your drawing with a feather, that ſo you may leave it ſo faint as but juſt to perceive your ſtrokes; and by this means you will the better ſee how to draw it over again with black lead, or elſe you would not be able to diſcern your ſtrokes.

As for the proportion of a Hand, you have it ſet down in the plate, here inſerted, by lines and figures, which ſhew the equalities of proportions in a Hand, and how many equal meaſures there are in it, which it will not be improper for you to acquaint yourſelf with, that you may by that means know when a Hand is well proportioned with juſt and equal diſtances.

But you ought not to forget this, that, according as the Hand turns one way or other, the proportions muſt be foreſhortened, according as they appear to the eye; ſo much as the Hand turns away from our ſight, ſo much it loſes of its ordinary proportion, and is made to ſhorten to that proportion, that the eye judges of it; nay, ſometimes a whole finger, ſometimes two or three, or more are loſt to our ſight, by the turning of the Hand another way from us, and ſo they muſt be wholly left out, and not made.

The proportion of the Hand conſiſts of three meaſures of the noſe, of which you are to make three equal pricked ſquares, marked perpendicular 1, 2, 3, the loweſt of which ſquares is divided into two equal parts, thereby to adjoin a half, making a third part unto that baſe, marked alſo 1, 2, 3, which is given to the ball of the thumb and fore finger near to the ſaid thumb, raiſing a pricked line perpendicularly up unto the top of the right Hand angle of the ſquare, marked above with I, making a pricked quill, within which the fore finger is contained, the length and top of which exceeds the upper joint of the middle finger; that being divided into three equal parts, the two equal joints or the two upper parts ſhall be of equal height to the upper part of the little finger, as appears in the figure of the Hand repreſented at B, and the thumb ſhall not exceed the ſecond or middle joint of the fore finger. See plates XXIII. and XXIV.

Then there remains a fourth meaſure for the wriſt, which is the meaſure of the noſe, the baſe or lower part of which is divided


A
B
C
D
1
2
3
4

vided into four parts, which ſhall ſerve for Hands ſeen on the ſide.

The ſame meaſures are obſerved, as well in the Hand ſeen without, as on the back, marked A.

To fore-ſhorten the Hands, you muſt firſt draw the perpendicular lines from the Hands ſeen ſlopewiſe, or aſide, marked with their proportions and meaſures 1, 2, 3, 4, ſee plate XXIII; upon which the ſun ſhining would ſo caſt them down to the diagonal marked at the end with O, and then carry the reflection of them levelly, from the interſection of thoſe perpendicular lines in the diagonal aforeſaid, until you come under the place of the fore-ſhortened Hands, thereby to get the ſhadow, from which ſhadow you muſt perpendicularly raiſe perpendicular lines, till they meet and interſect level lines, drawn alſo from the firſt Hand ſeen aſide; ſo will the interſections of the ſaid laſt named lines, and raiſed perpendiculars, give the fore-ſhortened Hands A B C D E, even as the eye would ſee the ſideways or ſloping Hands; and ſo will the workman ſee the Hand fore-ſhortened, by the means of the ſaid ſhadow.

HANDS, in painting in miniature, and the other nudities are to be done as the faces, obſerving to make the tip or end of each finger a little redder than the reſt.

Your work having been coloured and ſtippled, you muſt go over all the ſeparations of the parts, with fine touches of carmine and orpiment together, as well in the ſhades as in the lights; but ſtronger in the firſt, and then handle them away into the reſt of the fleſh.

Adrian HANNEMAN, was both a hiſtory and face painter, born at the Hague, diſciple to one Raveſteyn, and came to England in the reign of king Charles I. He was employed for ſome time under Mytens, principal painter to that king, and continued here ſixteen years; at the end of which he went for Holland, and there drew the princeſs dowager royal, his highneſs the prince of Orange, and all the court. He alſo drew that piece repreſenting peace in the ſtates chamber at the Hague; alſo the picture of two uſurers telling their gold, for Mynheer Van Wanwing; while he was doing this laſt piece, he happened to want money, whereupon ſending to the perſon he was at work for to borrow ſome, it was accordingly ſent him. When the picture was finiſhed, it was carried home, and the price demanded paid for it; but when Mynheer thought to have the money he had lent, having ſlipped the opportunity of ſtopping it out of mere generoſity, he was anſwered, that the gold that he had borrowed was all put into the picture, meaning that which the miſers were telling, and that he muſt expect no farther ſatisfaction. This painter died abroad about the year 1690.

HAR. *Holbenius*, ſignifies Holbenius of Harlem.

HARDENING, is the act of communicating a greater hardneſs to a body than it already has.

The Hardening and tempering iron and ſteel makes a conſiderable article in the mechanical arts.

There are divers ways of effecting it; as by the hammer, quenching it when hot in cold water, caſe Hardening, &c.

To harden and temper Engliſh, Flemiſh, and Swediſh iron, they give it a pretty high heat, then ſuddenly quench it in water to make it very hard. Spaniſh and Venice ſteel need only to have a blood-red heat, and then be quenched.

The workmen ſometimes grind indigo and ſallad oil together, and rub the mixture upon it with a woollen rag while it is heating, and let it cool of itſelf.

If the ſteel be too hard or brittle for an edge, ſpring, or pointed inſtrument, it may be taken down or rendered ſofter, thus: Take a piece of grindſtone or whetſtone, and rub hard on the work, to take the black ſcurf off it, and to brighten it; then let it heat in the fire, and, as it grows hotter, the colour will change by degrees, coming firſt to a light goldiſh colour, then to a darkiſh goldiſh colour, and at laſt to a blue colour. Chuſe which of theſe colours the work requires, and quench it ſuddenly in water.

Hammer HARDENING, is moſtly uſed on iron or ſteel plates, for ſaws, ſprings, &c.

Caſe HARDENING, is performed after the following manner: Take cow horn or hoof, dry it well in an oven, pound it to powder; put as much bay-ſalt as of this powder into ſtale urine, or white wine vinegar, and mix them well together; then cover the iron or ſteel all over with this mixture, and wrap it up in loam or plate-iron, ſo that the mixture may touch every part of the work; then put it in the fire and blow the coals to it, till the whole lump has attained a blood-red heat, but no higher, and then take it out and quench it.

HARMONY, in painting. Some mention a Harmony both in the ordonnance and compoſition, and in the colours of a picture.

In the ordonnance it ſignifies the union or connection between the figures, with relation to the ſubject of the piece.

In the colouring it denotes the union or agreeable mixture of different colours.

HARPOCRATES, the god of ſilence, was repreſented by the ancients in the form of a young child, holding one of his fingers cloſe to his lips, as a ſign of taciturnity. Some again portrayed him without any face at all, all covered with the ſkin of a wolf, painted full of eyes and ears.



To intimate that, it is good to ſee and hear much, but to ſpeak little.

HATCHING, } in deſigning, engraving, &c. ſignifies the
HACHING, } making of lines with a pen, pencil, graver, or the like, and the interſecting or going acroſs thoſe lines with others drawn over them another way.

The depths and ſhadows of draughts are uſually formed by Hatching.

HATCHMENT, is a popular name for an atchievement, or an eſcutcheon over a gate, door, or ſide of an houſe, with the coat armour of a perſon deceaſed.

HATRED, is an emotion of the ſoul, cauſed by the ſpirits, which incite the ſoul to deſire a ſeparation from ſuch objects as are repreſented as hurtful to it.

Hatred is ingendered out of jealouſy, and as Hatred and jealouſy are ſo near related to each other, and their external motions almoſt alike; there is nothing to obſerve of this paſſion particular or different from jealouſy, for which ſee plate XXVIII.

This paſſion wrinkles the forehead, the eye-brows are ſunk down and knit, and the eye-ball is half hid under the eye-brows, which turn towards the object; it ſhould appear full of fire, as well as the white of the eye and the eye-lid; the noſtrils are pale, more open, and more marked than ordinary, and drawn backwards, ſo as to make wrinkles in the cheeks; the mouth is ſo ſhut as to ſhew that the teeth are cloſed; the corners of the mouth are drawn back, and very much ſunk down; the muſcles of the jaw appear ſunk; the colour of the face is partly inflamed and partly yellowiſh; the lips pale or livid.

John HAYLES, was a good face-painter, contemporary and competitor with Sir Peter Lely; was ſo excellent a copyiſt, that many of the portraits which he did after Van Dyke, paſs at this day for originals of this prodigious man. He died in London in the year 1679, and lies buried in St. Martin's church.

H. B. This mark was uſed by Hans Burkmair, who engraved thirty-ſix hiſtorical pieces relating to the empire. Hans Broſanier, who lived in 1538, and Horatio Borgiani of Rome.

H. *Bol.* ſignifies Hans Bol, i. e. John Bol, in certain landſcapes.

H. C. ſignifies Hans Leifrink in certain plates of birds, and parties of hunting in frizes.

To draw a HEAD *in profile or ſideways.* The manner to make this head by juſt and ſafe rules is thus:

Firſt form an equal triangle, in what poſition you pleaſe, turning the triangle to make the face upon one of the three ſides, be it which it will, either upwards or downwards, higher or lower, dividing that ſide into three equal parts; the one to ſerve

from the lower part of the hair to the lower part of the forehead; the ſecond from thence to the under part of the noſtrils; the third to the lower part of the chin. See plate XXV.

Theſe three lines being framed, draw a little crooked ſtroke with a coal or chalk, out of the right line that may reach from the top of the forehead to the eye-brow; from whence draw away the ſlope line, bending at the end.

To place the noſe, either long, ſhort, groſs, or thin, as you would have it, ending that at the ſecond diſtance, where the noſtrils end; then ſubdivide the remaining third part in the midſt, where the mouth ſhould be placed for the parting of the upper and under lips; then frame the chin, having regard to the perpendicular line, that it fall not out of the middle of the chin, adjoining thereto the under chin down to the throat pit.

Then with the other two dividing lines, the one from the top of the forehead downwards, and ends in the midſt of the back part of the ear, the other proceeds upwards from the chin, aſcending till that meet with the ſuperior deſcending line, whoſe interſection directs the ear, that the circumference thereof ſtretch not too far.

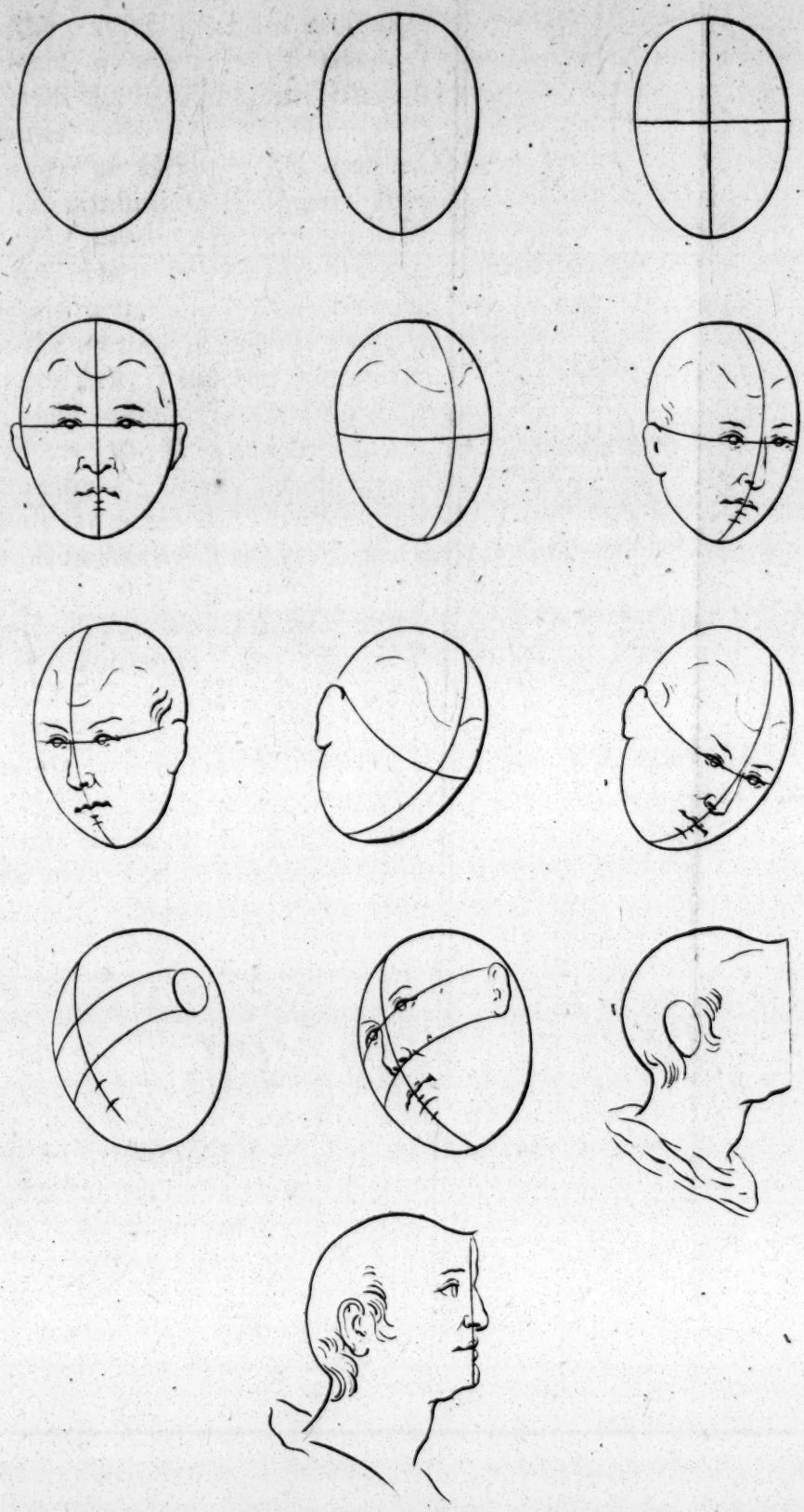
Thus take the upper part of the forehead, and deſcribe a great circular line about to form with that the roundneſs of the head unto the nape of the neck, keeping the proportion that nature teaches; and from thence downwards form the reſt of the neck, obſerving to make the tip of the ear not to exceed the lower part of the noſtrils.

So you may have the head in what poſition you pleaſe, ſo this abandon not the other two lines, each concurring in their due points.

To draw a HEAD *with a foreright face.* To do this, form a perfect oval, which divide in the midſt with a line the longeſt way, i. e. a perpendicular line; divide this line into three equal parts, allowing a fourth of one of the three parts for the hair in the forehead; the firſt for the forehead, the other for the chin. See plate XXV.

In the midſt of theſe the mouth is to be formed, always taking care that the eyes be in one line, and the croſs line of the noſe and mouth muſt always be correſpondent to the croſs-line, where the eyes are placed; and the eyes muſt be the length of one eye diſtant from the other, and their inward corners muſt be perpendicularly over the outſide of the noſtrils; but, to make the ears in a foreright face proportionable, they muſt be much foreſhortened by foreſhortening, by which is meant that the eye does not ſee the full latitude of it.

The proportion of the length of the ear is from the eye-brows to the bottom of the noſtrils, and then it is to join the neck



with the hair in ſuch a manner as may be moſt agreeable to the eye.

Of the HEAD *in foreſhortening.* Make a circular draught, with the aſpect upwards or downwards, as in the foreright head, where the traverſe lines are ſtraight, but theſe go circular; for, if the heads fly upwards, the traced ſtrokes and diviſions muſt be raiſed with caution, that the ears and eyes fall not out of their due points.

Meaſures or HEIGHTS, *and diminution of elevated figures.* As to the diminution of figures, when placed on high, we are to take our meaſures in proportion for ſuch as are to be raiſed in paintings, when they be placed on mountains, houſes, or above the clouds in the air. The two rules we have now to give, will render the method extremely eaſy.

For the firſt, I ſuppoſe the man A, plate XXVII, fig. 1, to be ſix feet; which Height I ſet off ſeveral times on a perpendicular B over the baſe line 6, 12, 18, &c. draw lines to the head of the figure A; then, ſetting one point of the compaſs at letter A, with the other deſcribe the arch C D, and the interſection that arch makes with the rays, are the meaſures to be given the figures.

Thus, if you would have a figure appear forty-two feet high above the ſame baſe line, take E D, which cuts the two laſt rays, and ſet it off to F, fig. 2, which is forty-two feet above the ſame baſe A B.

If another be required thirty feet high, you muſt take the diſtance G H, fig. 1, which cuts the rays 30, 36, and gives the Height of the figure P, fig. 2, and ſo of the reſt.

The main point is the approaching or receding of the line B, fig. 1, which muſt always be the diſtance between the ſpectator and the object, viz. thirty feet, or thereabouts.

For the ſecond rule; inſtead of the line B, uſed in the firſt figure, the diviſion is made from ſix feet to ſix on the baſe line I T, fig. 3. The two firſt points 1 and 6 are to be drawn to the point of ſight K. Thus between the two rays I K and 6 K you have the meaſure of ſix feet, which is the Height to be given the figures. Then from all the other diviſions 12, 18, 24, 30, &c. draw lines to the point of diſtance L; and in the interſections made by the ray 6 K draw little parallels to the baſe line between the rays I K and 6 K. Theſe parallels will give the Heights of figures unequally high, but at the ſame diſtance; which may be proved by comparing the meaſures of the firſt method with thoſe of the ſecond. See fig. 1, 2.

If it be aſked how much each figure is diminiſhed from the firſt, which is ſix feet high, you need only to take the Height of the figure required in your compaſſes, and ſet it off on your

little ſcale M in the third figure, and your queſtion is ſolved.

Thus having taken the Height of the figure P, and ſet it on the ſcale M, it gives four feet, which ſhews that a figure ſix feet high, raiſed thirty feet, will appear to be but four feet. The Heights and diminutions of the reſt are found by the ſame operation, provided the diſtance be the ſame with that of theſe. If the diſtance be changed, the proceſs muſt begin anew.

The figures V, X, Y, which are in the clouds in the third figure underneath, are of the ſame Height and proportion as in the ſecond figure. They are only here added to ſhew, that, though the method be different, the effects are the ſame.

What has been ſaid as to the Heights and diminutions of figures on the baſe line A B in the firſt method, and I T in the ſecond, muſt be obſerved in proportion as they are ſunk further behind; and the higheſt muſt have the ſame relation to thoſe under ground which are in the ſame line as theſe at F and P have to that at A. Thus in the ſecond rule, if over-againſt the left figure N there were another figure placed on a tower forty-eight or fifty feet high, and its magnitude required, it muſt be put in the ſame proportion as N has to I.

And, inaſmuch as the laſt N only contains two and a half of the ſix parts which I contains, this upon the tower muſt only have two and a half of the ſix parts in the figure N.

What renders this rule the more valuable is, that all the proportions of figures may be learned by heart; for whoever would be at the trouble of making this meaſure, where he might add more parts, they would ſerve him for ever, and he would render them ſo familiar, that in a little time he would be able to tell off hand, that if you are at thirty-five feet diſtance, and the figure ſix feet or ſix parts high when on the ground; another that ſhall be of the ſame ſize, will only appear five feet and a half, when raiſed to the Height of twelve feet; and but five, if raiſed eighteen feet; but four and a half, if twenty-four feet; but four, if thirty; but three, if thirty-ſix; and two and a half, if forty-two; and ſo on by ſix and ſix to any number you pleaſe.

To find the HEIGHT *of remote figures, whereof the firſt is on a mountain near the eye.* It is a thing that gives a great deal of ſatisfaction to the mind, when a perſon knows what he does; on which account it is preſumed that the reader will be well enough pleaſed to have the following rule:

When ſuch figures are to be made, determine the Height of the firſt, that is, the ſpace of ground you would have it raiſed; and at that diſtance put another figure underneath, of the ſame Height as the firſt; and from the feet and head thereof draw lines to the horizon, by which you will have the Height of the other figure in the champaign. To explain myſelf,

The

Facing P. 424. Plate XXVI.

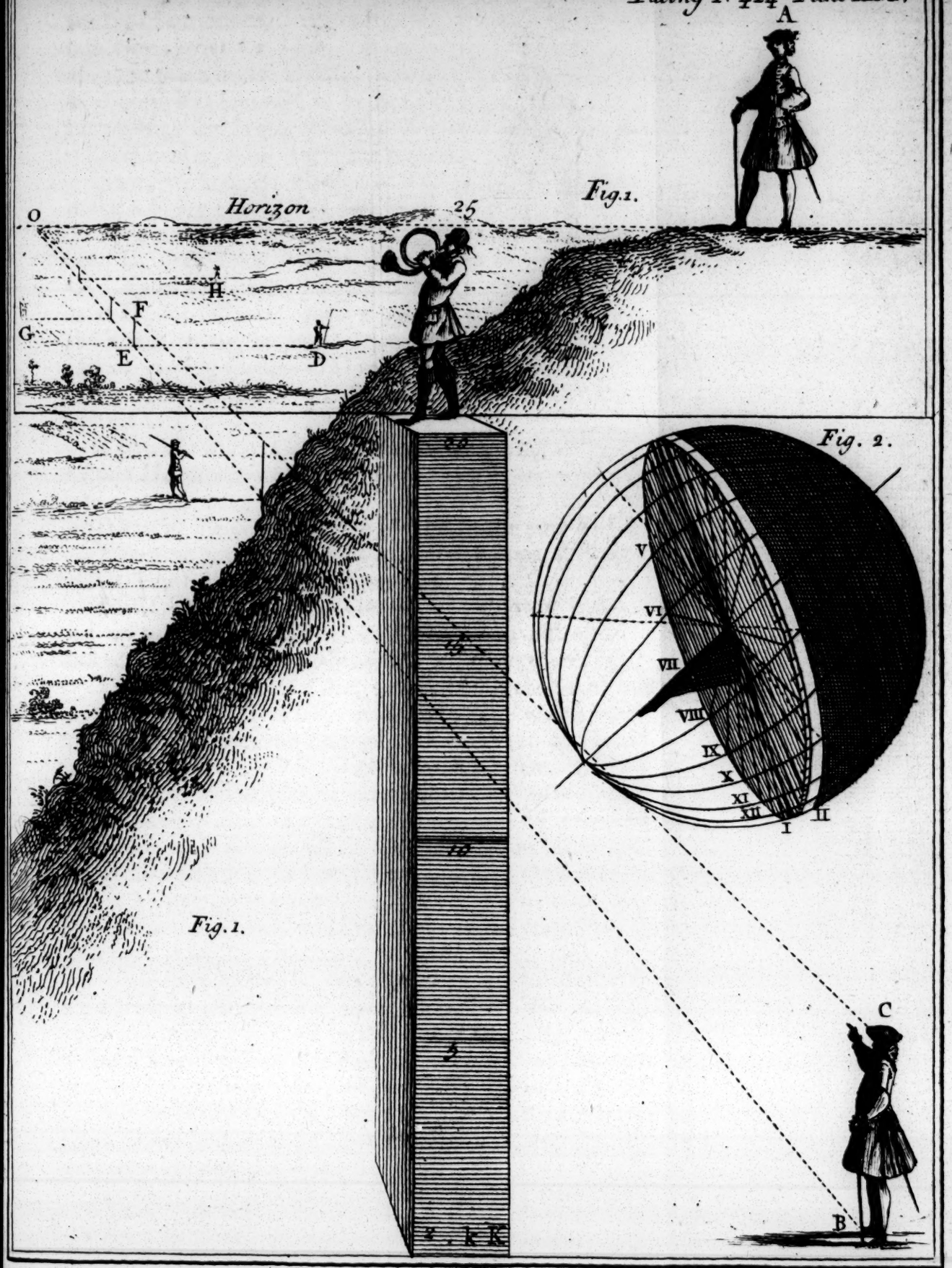
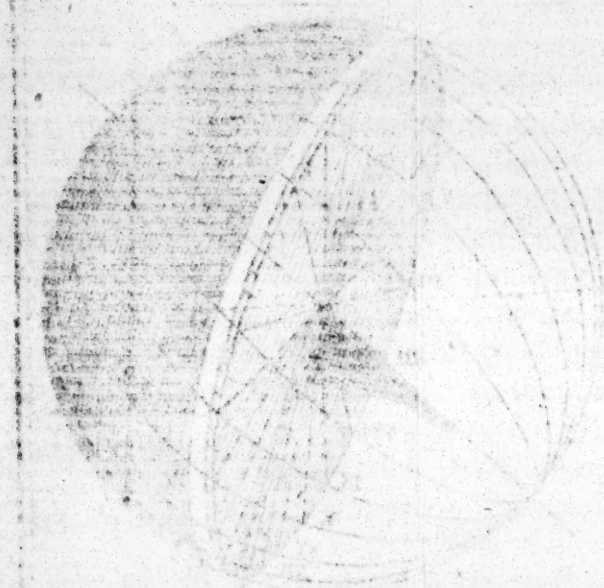


Fig. 1.



The figure A, plate XXVI, fig I. for example, which is on the top of a mountain, is five feet high; and I ſuppoſethe mountain twenty-five feet high. If now a man be raiſed twenty feet, as is the piece in the middle, whereon the ſpectator is mounted, who himſelf is ſuppoſed to be five feet high, the horizon will be twenty-five feet high, as well as the mountain, and conſequently will be level with the top of the mountain.

Now, to find the Height of the people in the champaign, make a figure twenty-five feet lower, underneath the figure A, or in ſome other place, as B C; and from the feet B, and the head C, draw lines to ſome place in the horizon, as the point O. Then to find the Height of any figure on the champaign, as at D, for inſtance, draw a parallel to the baſe line till it cut the line B in the point E, from which a perpendicular is to be raiſed, cutting the line C O in the point F; and take the Height of this perpendicular E F for the Height of the figure in the point D.

If you likewiſe require the Height of the figures in the points G and H, proceed after the ſame manner as in the figure D, and you will have their Heights between the lines B and C, to be taken in the compaſſes, and ſet off in the points G and H.

The ſame you are to do for any other figures, ſtill diminiſhing, till at length you come to a mere point.

HELLEBORE, in miniature. The flower is done by laying on white, and ſhading with black and biſtre, making the outſide of the leaves a little reddiſh here and there.

The ſeed muſt be of a deep green, heightened with maſticote.

The green muſt be ſad, and is to be done with verditer, maſticote, and biſtre, and finiſhed with iris green and biſtre.

Egbert HEMSKIRK, was born at Harlem, and diſciple of De Grebber. He became very eminent for painting drolls after the manner of Brawer. His comical genius ſucceeded for a long while amongſt us in moſt of his converſation pieces; you may ſee all the pictures, and read the manners of the men at the ſame time, a thing chiefly aimed at. His drunken drolls, his wakes, his quakers meetings, and ſome lewd pieces have been in vogue amongſt waggiſh collectors, and the lower rank of virtuoſi. He often introduced his own picture among his drolls by means of a looking-glaſs he had upon his pallet. He was a man of wit, and therefore valued by the earl of Rocheſter, for whom he painted ſeveral pieces. He died in London about ſixty years ago; leaving behind him a ſon, whom he had inſtructed in his way.

Martin HEMSKIRK, born in the year 1498, ſcholar of Jean Lucas and Schoorel, lived in Holland, excelled in hiſtory, died in 1574, aged ſeventy-ſix years.

HERESY, is repreſented, in painting, by an old lean hag of a terrible

terrible aſpect, flames iſſuing out of her mouth, her hair hanging diſorderly about her breaſts, and moſt of her body bare; her dugs flagging; in her left hand a book ſhut up, ſerpents coming out of it, and with her right ſeems to ſcatter them abroad.

Her oldneſs denotes her inveterate malice, becauſe deprived of the light of faith; the flame denotes impious opinions; her breaſts ſhews that vigour is dried up, that ſhe cannot nouriſh good works; and ſcattering ſerpents, the diſperſing falſe doctrines.



Cornelius HEVISSEN uſed this mark.

John VANDER-HEYDON, was a good face-painter, and a native of Bruſſels; coming over to England, he worked for Sir Peter Lely in his draperies, and copying ſeveral years, till, afterwards marrying, he went into Northamptonſhire, where he was employed by moſt of the noblemen and gentry of that country. He died about ſeventy years ago at my lord Sherrard's, and lies buried at Stapleford in Leiceſterſhire.

Nicholas HILLIARD, was a celebrated Engliſh limner, drew queen Mary of Scots in water colours when he was but eighteen years of age, wherein he ſucceeded to admiration, and gained a general applauſe. He was both goldſmith-carver and limner to queen Eliſabeth, whoſe picture he drew ſeveral times; particularly once, when he made a whole length of her ſitting on her throne, which piece was deſervedly eſteemed. There are moreover two wonderful pieces of his, in miniature. One of theſe is the picture of our artiſt himſelf. The other is the picture of his father, ſometime high ſheriff of the city and county of Exeter.

Theſe two pictures, though not much bigger than a crown, are ſo maſterly done, that not only the faces are finely coloured, and naturally with a good relievo; but alſo the heads and beards are ſo well performed, that almoſt each ſingle hair is expreſſed.

HISTORY, in painting, is a picture compoſed of divers figures or perſons, repreſenting ſome tranſaction or piece of Hiſtory, either real or feigned.

Painters are diſtinguiſhed into portrait-painters, flower and fruit painters, landſcape-painters, painters of beaſts and Hiſtory-painters; and the firſt place or rank is univerſally allowed to Hiſtory-painters, as the moſt difficult, maſterly, and ſublime province.

A good Hiſtory-painter ought to underſtand all things, becauſe he is to repreſent all things; he ought to be naturally a quick, free, good inventor and deſigner, as alſo to know well how to order and ſtell his figures after that manner, if there be many

Fig. 2.



Fig. 4.

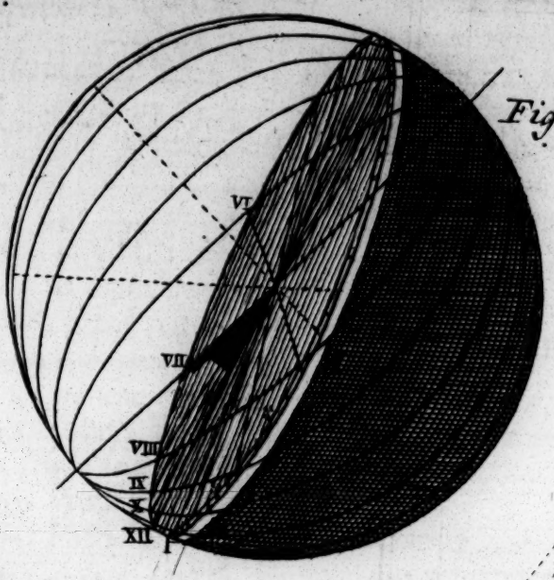


Fig. 1.

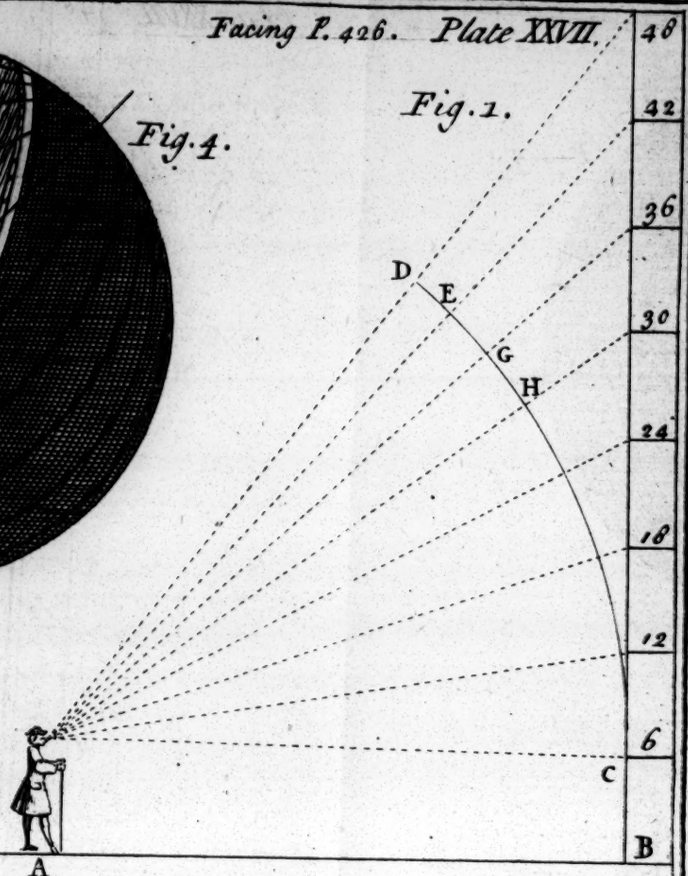
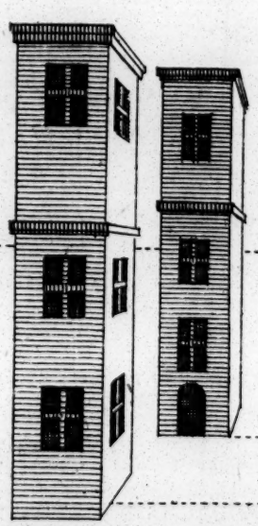
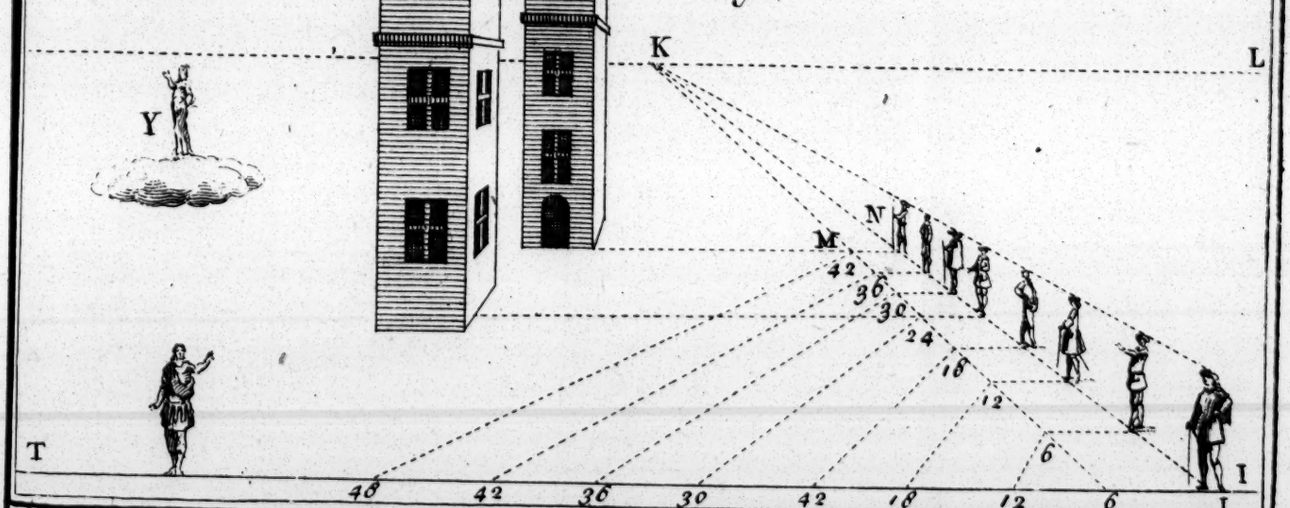






Fig. 3.





many in one piece, that they may not ſeem to be crowded; but to order them gracefully on the foreground eſpecially, and the reſt of the figures to leſſen and decline proportionably, both in height and ſtrength by degrees at their ſeveral diſtances.

And a Hiſtory-painter muſt of neceſſity underſtand anatomy, arithmetic, architecture, geometry, and perſpective, &c. and not only the true ſhape of man's body, but of all other creatures whatſoever, and all the ſhapes and forms that are in the world.

HISTORY, is repreſented, in painting, by a woman reſembling an angel with great wings, looking behind her, writing on an oval table, on the back of Saturn.

The wings denote her publiſhing all events with great expedition; her looking back, that ſhe labours for poſterity; her white robe, truth and ſincerity; Saturn by her ſide denotes time, and the ſpirit of the actions.

Wenceſlaus HOLLAR, was a gentleman born at Prague in Bohemia in the year 1607. He was much inclined to miniature and etching, in which laſt art he became exceeding famous. In the year 1627, he left Prague, and viſited many cities of Germany, when, coming at laſt to Cologn, he waited upon the earl of Arundel, that truly great and noble patron of arts, who was there on his embaſſy to the emperor at Vienna, and afterwards came over with him to England. He lived here for ſome time, and drew many churches, ruins, perſons, and views, which he afterwards etched, which will always be in good eſteem. His particular excellency was etching; there are a great number of his prints in England. He at laſt got into the ſervice of the duke of York; but, upon the breaking out of the civil wars, retired to Antwerp, and there died.

Hans HOLBEIN. His manner was extraordinary and unuſual, differing both from the ancients and moderns, ſo that it ſeems as if he had not been incited or inſtructed by any example, but rather that he followed purely the dictates of his genius. There is nothing to be ſeen of his doing but what is painted to the utmoſt perfection; this is manifeſt by that piece of his of death's dance in the town-hall at Baſil, the deſign whereof he firſt cut neatly in wood, and afterwards painted, which appeared wonderful to the learned Eraſmus. He requeſted of him to draw his picture, deſiring nothing ſo much as to be repreſented by ſo judicious a hand.

This being performed, and Eraſmus thinking that he deſerved a more plentiful fortune, he perſuaded him to come for England, promiſing him conſiderable advantages from the bounty of king Henry VIII. At his requeſt, Holbein ſet out for this kingdom, bringing along with him Eraſmus's picture, and letters of recommendation from that great man to the then lord chancellor Sir

Thomas

Thomas More, who received him with all joy imaginable, and kept him for three years at his own houſe; during which time he drew his picture, and thoſe of many of his friends and relations, all which were hung up in the great hall of that houſe. The king coming one day to dine with Sir Thomas, and at the entrance into the hall beholding ſo many raviſhing objects, the pictures ſeeming almoſt as much alive as the perſons, who were all there preſent, his majeſty ſo much admired the excellency of the painter, that the next day he ſent for him, and entertained him in his ſervice upon very advantageous terms; the king from time to time manifeſted the great eſteem and value he had for him.

Hans HOLBEIN, born in 1498, ſcholar to his father, lived in Switzerland and London, excelled in hiſtory and portraits, died in 1554, aged fifty-ſix years.

Abraham HONDIUS, born at Rotterdam in the year 1638. He was a painter whoſe manner was univerſal; he drew hiſtory, landſcapes, cielings, and ſmall figures; among all the reſt, beaſts and hunting pieces were all his ſtudy. In all theſe kinds his colouring was often extravagant, and his draught as commonly uncorrect. He delighted much in fiery tinct, and a harſh way of penciling; ſo that, few of his pictures being without this diſtinguiſhed mark, his paintings are eaſy to be known. His dogs and huntings are in good requeſt, though ſome of his latter were careleſs. He was for many years afflicted with the gout ſo ſeverely, that he had prodigious ſwellings and chalk-ſtones in moſt of his joints, the effects of a ſedentary and irregular life. This diſtemper occaſioned his death in London about the year 1691.

HOPE, is a ſtrong appearance or opinion of obtaining that which one deſires.

This paſſion keeps all the parts of the body ſuſpended, between fear and aſſurance, in ſuch a manner, that, if one part of the eye ſhews ſigns of fear, the other part intimates ſecurity; and ſo in all the parts of the face and body the motions of theſe two paſſions are participated and intermixed. See plate XXVIII.

HOPE is repreſented, in painting, by a beautiful young girl in a long robe, hanging looſe, ſtanding upon tip-toes, and a trefoil or three-leaved graſs in her right hand, and an anchor in her left.

The looſe veſtment intimates, that ſhe never pinches or binds truth; her poſture, ſtanding on tip-toes, ſhews ſhe always ſtands dangerouſly; the branch of trefoil denotes knowledge, faith, and Hope itſelf.

HOPE is alſo repreſented, as a young woman, clad in green, with a garland of flowers, holding a little Cupid in her arms, to whom ſhe gives ſuck.

The flowers denote Hope, they never appearing without ſome

Horrour.



Hope.



Hope.



Joy.



Horrour.



Jealousy.



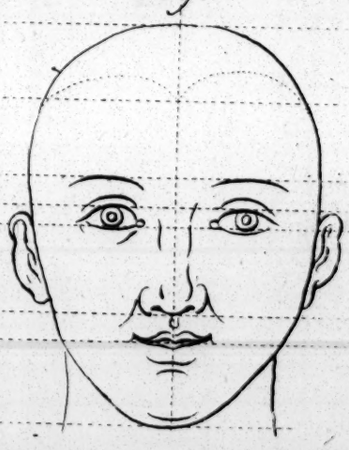
Laughter.



Joy.



Joy.



Hope of fruit; the Cupid, that love without Hope grows languid, and is not laſting, as, on the contrary, it is deſperate, and ſoon at an end.



Lambreckt HOPFER, a German, engraved all kinds of ſubjects. Sometimes his mark is a vaſe of flowers in the midſt of the letters L H, or the perpendicular ſtroke of the L ſtruck off the H. He engraved twenty-ſeven pieces on the paſſion.

To ſoften HORNS. Take urine a month old; quick lime two pounds; calcined tartar one pound; crude tartar and ſalt of each half a pound; mix and boil them all together; then ſtrain out the liquor twice or thrice; put in the Horns, let them lie and ſoak for eight days, and they will become ſoft.

Another way. Take aſhes, of which glaſs is made, and quick lime of each two pounds; boil them in a ſufficient quantity of water, till one third part is conſumed; then putting a feather into it, if it peels, it is boiled enough; if not, boil it longer; and when it is enough clarify it, and pour it off, and put filings of Horn in it for two days; anoint your hand with oil, and work them as if they were paſte, and into what form you pleaſe.

To caſt HORN *in a mould like lead.* Make a lixivium of calcined tartar and quick lime; into this put your filings or ſcrapings of Horn; boil them well together till they come to a pap, tinge this of what colour you would have it, and you may afterwards caſt it in a mould, and make of it any thing of what form you pleaſe.

To dye HORNS. See BONE.

HOROGRAPHY, is repreſented, in painting, by a young virgin winged, cloathed in a ſhort robe of ſky colour, with an hour-glaſs on her head; in her right hand ſhe holds inſtruments for dialing, and in her left hand a ſun-dial; the ſun over her head ſhewing with its rays the ſhadow of the gnomon directed to the hour current.

Her youth denotes the hours continually renewing their courſe ſucceſſively; the curtailed coat and wings, the rapidity of the hours; the ſky colour, the ſereneneſs not prevented by clouds; the hour-glaſs ſhews the time of night, as the other does that of the day.

HORROR; an object deſpiſed or ſcorned ſometimes cauſes Horror, which, if inſtead of ſcorn it raiſes Horror, the eye-brow will be ſtill more frowning than in that of ſcorn; the eye-brow will knit and ſink a great deal more, and the eye-ball, inſtead of being in the middle of the eye, will be drawn down to the under lid; the mouth will be open, but cloſer in the middle than at the corners, which, being drawn back, makes wrinkles in the cheeks;

cheeks; the colour of the viſage will be pale, and the lips and eyes ſomething livid. This action has ſome reſemblance to terror. See plate XXVIII.

In Horror, the motions ſhould be much more violent than in ſcorn or averſion, the body violently retiring from the object which cauſes the Horror. The hands ſhould be wide open, and the fingers ſpread; the arms drawn in cloſe to the body, and the legs in an action of running.

John HOSKINS, was an eminent limner, in the reign of king Charles I, whom he drew with moſt of the court. He was bred a face-painter in oil, but, afterwards taking to miniature, he far exceeded what he did before. He died in Covent-garden about a hundred years ago. He had two conſiderable diſciples, who were Alexander and Samuel Cooper, the latter of which became the moſt eminent limner.

HOSPITALITY, is repreſented, in painting, by a lovely woman, her forehead ſurrounded with a crown ſet with jewels, with her arms open to relieve ſomebody; holding a cornucopia full of all neceſſaries, clad in white, and over all a red mantle, under which ſhe holds an infant naked, ſeeming to participate ſome of the fruit with her, and a pilgrim lying on the ground.

Her handſomeneſs intimates, that works of charity are acceptable to God; the golden circle denotes her thinking of nothing but charity. Her white raiment ſhews, that Hoſpitality ought to be pure.



Vuaer Van HOSSANEN, engraved twelve round plates of the paſſion, and underneath various ſymbols of our Saviour. He likewiſe engraved the life of Chriſt in ſixty plates. He uſed this mark.

HOUSES, *or buildings, viewed by the angles in perſpective.* Of theſe two buildings ſeen angle-wiſe, the firſt is performed after the manner of ſquares viewed the ſame way, and elevations of other things in ſide views.

However, to ſave the trouble of recurring to the one and the other, I ſhall here obſerve, that, to perform ſuch buildings, the meaſures muſt be ſet on the baſe line, and from each of them lines are to be drawn to the point of diſtance; and from the points of interſection perpendiculars are to be raiſed, the firſt angle ſerving for a line of elevation.

Thus in the preſent building the breadth being A B, plate XXX, and the length B C double its breadth; from A and B lines are to be drawn to the point of diſtance D; and from B and C to the point of diſtance E.

Then, obſerving where B C or B E are interſected thereby, raiſe the poſts of the windows therein. The perpendicular of the

Facing P. 430. *Plate XXIX.*

the firſt angle B, ſerving for a line of elevation, will give the croſs pieces and the height of the windows; the reſt is obvious.

As to the figure underneath, the method is the ſame as for chairs placed irregularly, i. e. having made the plan, put it in perſpective, as irregular objects are put; then laying a ruler along each ſide of the plan, obſerve where it cuts the horizon, and marking the points draw lines thereto from each part of that ſide of the building.

Every face or ſide of a building has its particular point.

Thus the plan being put in perſpective; the ſide H I gives the point K on the horizon, to which all the rays on that ſide muſt be drawn.

The other ſide I L ſhould likewiſe have its point; but, for want of room on the paper, it could not be here expreſſed.

Having found theſe two points, lay a ruler upon it, and an occult line over the other ſide of the building parallel upon the plan, parallel to that which gave the point in the horizon; and continue it to the baſe line, as from K through L to M; and from the other point continue an occult line through H to N.

Then ſetting the number of windows on the ſide H I, between N and I, and between I and M ſetting the number of the windows on the ſide I L; draw lines from all theſe points or meaſures on the baſe line to the point in the horizon, and proceed as in the figure above.

James HOUSMAN, alias HUSYMAN, was a hiſtory and face painter, who reſided in England in the time of Sir Peter Lely, and endeavoured to rival him in the portrait way. He was born at Antwerp, and bred up to painting under one Bakerrel, who was brought up with Van Dyke, in the ſchool of Rubens. This Bakerrel was not much inferior to Van Dyke, as is to be ſeen in ſeveral churches in Antwerp, eſpecially of that of the Auguſtine monks, where Van Dyke and he have painted to outdo each other, and both had commendations in their different ways; though the ſuperiority was yielded to neither. But, Bakerrel being a poet as well as a painter, he wrote a ſatyr upon the jeſuits, on which account he was forced to leave the city of Antwerp, ſo that Houſman, having by that means loſt his maſter, came for England; ſome of his hiſtory pieces are well painted, his colouring being bright and ſanguine. Some Cupids of his were much admired, but what he valued himſelf moſt upon was the picture of Catharine the queen dowager of England. This picture did him great ſervice, ſo that he was always boaſting of that performance, calling himſelf her majeſty's painter. He died in London about ſeventy years ago, and lies buried at St. James's.

H. S. 1558. ſtands for Hercules Septimus Mutinenſis, in certain figures and ornaments of building.

H. V.

H. V. C. 1517. ſignifies Hans vel Culihac, who was ſcholar to Albert Durer.

HUMILITY, is repreſented, in painting, by a virgin all in white, her arms acroſs upon her breaſt, her head inclined, a golden crown at her feet.

The white robe ſhews the purity of the mind, begets ſubmiſſion; holding down her head, confeſſion of her faults; treading on a crown ſhews Humility, diſdaining the grandeur of the world.

HYACINTH. The flower is of four ſorts: 1. A deep blue. 2. A paler blue. 3. A gridelin. 4. A white.

To paint them in miniature.

For the firſt uſe ultramarine and white, ſhaded and finiſhed with leſs white.

For the ſecond, make that of a paler blue.

For the third, uſe lake and white and a very little ultarmarine, and finiſh it with the ſame colours, but of a deeper degree.

The fourth muſt be all white, and then ſhaded with black and a little white; finiſh with ſtrokes of the ſame turn, with the outline of the leaf.

The green and ſtalk of the blue kind muſt be of the ſea ſort, ſhaded with a very deep iris, and in the ſtalk of the firſt you uſe a little carmine to give it a reddiſh caſt.

The ſtalks of the two others and their greens muſt be coloured with verditer and maſticote, ſhaded with bladder green.

HYDROGRAPHY, is repreſented, in painting, by an ancient matron in a cloth of ſilver garment, the ground of which reſembles the waves of the ſea; ſtars above, in one hand a chart of navigation and the compaſſes; in the other, a ſhip and the mariners compaſs on the ground before her.

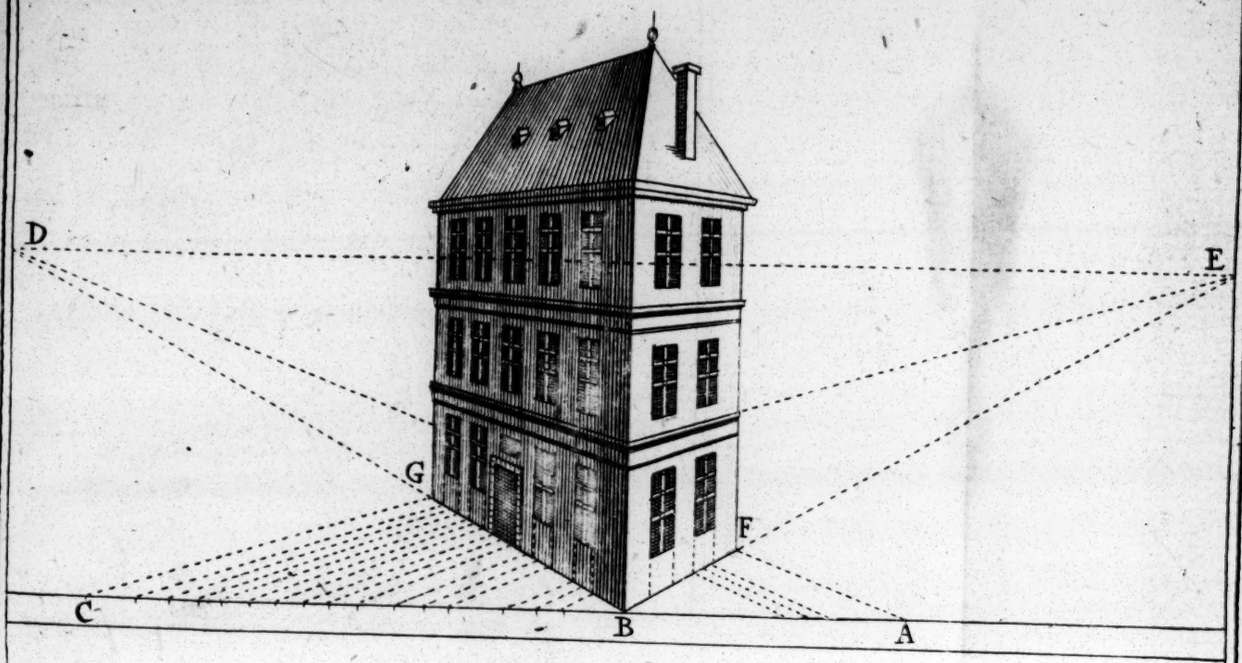
Her garment ſignifies the water and the motion thereof, which is the ſubject of Hydrography; the compaſs, the regulating and deſcribing by the help of it; the chart ſhews all the winds, and the ſureſt way to ſail.

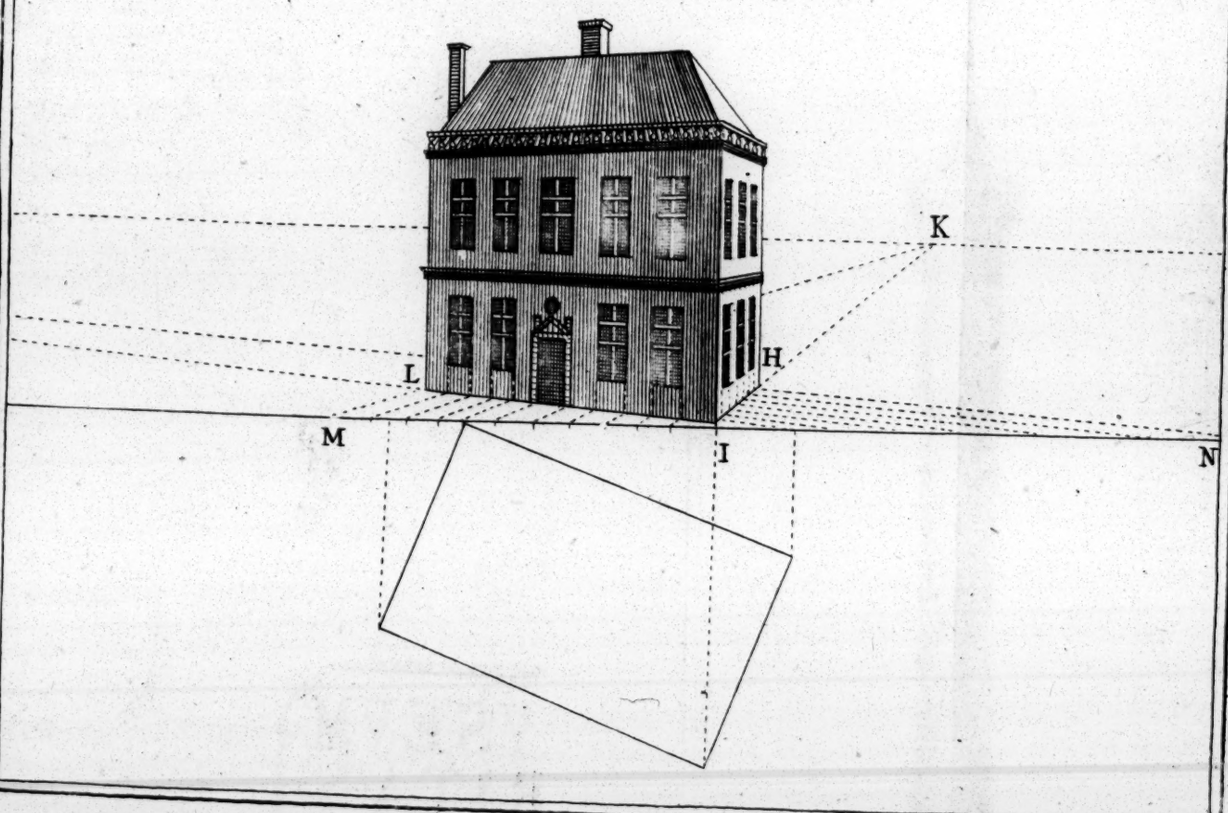
HYPOCRISY, is repreſented, in painting, by a meagre pale woman in a linſy-woolſy garment, her head inclining to the left; her veil covers moſt of her forehead, with beads and a maſs book; ſhe puts forth her arm in the aſſembly to give a piece of money to ſome poor body with legs and feet of a wolf.

Linſy-woolſy, the linen denotes malice, and the woollen ſimplicity; her head inclined, with the veil covering her, all ſhew Hypocriſy; the offering money, vain-glory; her feet, that outwardly ſhe is a lamb, but inwardly a ravening wolf.

The End of the FIRST VOLUME.

MVSEVM BRITANNICVM





Toms sculp.